



**THE
TURKISH ONLINE
JOURNAL
OF
EDUCATIONAL
TECHNOLOGY**

November, 2017
Special Issue for IETC 2017

Prof. Dr. Aytekin İşman
Editor-in-Chief

Editors
Prof. Dr. Jerry Willis
Prof. Dr. J. Ana Donaldson

Associate Editor
Assist. Prof. Dr. Fahme Dabaj

Assistant Editor
Assoc. Prof. Dr. Eric Zhi - Feng Liu

ISSN: 2146 - 7242

Indexed by
Education Resources Information Center – **ERIC**
SCOPUS - ELSEVIER

Copyright © THE TURKISH ONLINE JOURNAL OF EDUCATIONAL TECHNOLOGY

All rights reserved. No part of TOJET's articles may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publisher.

Published in TURKEY

Contact Address:
Prof. Dr. Aytekin İŞMAN
TOJET, Editor in Chief
Sakarya-Turkey

Message from the Editor-in-Chief

Dear Colleagues,

We are very pleased to publish Special Issue for IETC-2017 conference. This issue covers the papers presented at International Educational Technology Conference and International Teacher Education Conference which were held in Harvard University, Manchester, USA. These papers are about different research scopes and approaches of new developments and innovation in teacher education and educational technology.

Call for Papers

TOJET invites you article contributions. Submitted articles should be about all aspects of educational technology. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJET. Manuscripts must be submitted in English. TOJET is guided by its editors, guest editors and advisory boards. If you are interested in contributing to TOJET as an author, guest editor or reviewer, please send your CV to tojet.editor@gmail.com.

November, 2017

Prof. Dr. Aytekin ISMAN

Sakarya University

Editorial Board

Editors

Prof. Dr. Aytekin İşman - Sakarya University, Turkey
Prof. Dr. Jerry Willis - ST John Fisher University in Rochester, USA
Prof. Dr. J. Ana Donaldson - AECT President

Associate Editor

Assist.Prof.Dr. Fahme Dabaj - Eastern Mediterranean University, TRNC

Assistant Editor

Assoc.Prof.Dr. Eric Zhi - Feng Liu - National Central University, Taiwan

Editorial Board

Prof.Dr. Ahmet Zeki Saka - Karadeniz Technical University, Turkey
Prof.Dr. Akif Ergin - Başkent University, Turkey
Prof.Dr. Ali Al Mazari - Alfaisal University, Kingdom of Saudi Arabia
Prof.Dr. Ali Ekrem Özkul - Anadolu University, Turkey
Prof.Dr. Anil P. Gaikwad - Yashwantrao Chavan Maharashtra Open University, India
Prof.Dr. Antoinette J. Muntjewerff - University of Amsterdam
Prof.Dr. Arif Altun - Hacettepe University, Turkey
Prof.Dr. Arvind Singhal - University of Texas, USA
Prof.Dr. Asaf Varol - Firat University, Turkey
Prof.Dr. Aytekin İşman - Sakarya University, Turkey
Prof.Dr. Brent G. Wilson - University of Colorado at Denver, USA
Prof.Dr. Buket Akkoyunlu - Hacettepe University, Turkey
Prof.Dr. Carmencita L. Castolo - Polytechnic University of the Philippines, Philippines
Prof.Dr. Cengiz Hakan Aydın - Anadolu University, Turkey
Prof.Dr. Chang-Shing Lee - National University of Tainan, Taiwan
Prof.Dr. Charlotte N. (Lani) Gunawardena - University of New Mexico, USA
Prof.Dr. Chi - Jui Lien - National Taipei University of Education, Taiwan
Prof.Dr. Chih - Kai Chang - National University of Taiwan, Taiwan
Prof.Dr. Chin-Min Hsiung - National pingtung university, Taiwan
Prof.Dr. Colin Latchem - Open Learning Consultant, Australia
Prof.Dr. Colleen Sexton - Governor State University, USA
Prof.Dr. Demetrios G. Sampson - University of Piraeus, Greece
Prof.Dr. Dimiter G. Velez - University of National and World Economy, Bulgaria
Prof.Dr. Don M. Flournoy - Ohio University, USA
Prof.Dr. Dongsik Kim - Hanyang University, South Korea
Prof.Dr. Enver Tahir Rıza - Dokuz Eylül University, Turkey
Prof.Dr. Eralp Altun - Ege University, Turkey
Prof.Dr. Feng-chiao Chung - National pingtung university, Taiwan
Prof.Dr. Ferhan Odabaşı - Anadolu University, Turkey
Prof.Dr. Finland Cheng - National pingtung university, Taiwan
Prof.Dr. Fong Soon Fook - Universiti Sains Malaysia, Malaysia
Prof.Dr. Francine Shuchat Shaw - New York University, USA
Prof.Dr. Gianni Viardo Vercelli - University of Genova, Italy
Prof.Dr. Gwo - Dong Chen - National Central University Chung - Li, Taiwan
Prof.Dr. Hafize Keser - Ankara University, Turkey
Prof.Dr. Halil İbrahim Yalın - Gazi University, Turkey
Prof.Dr. Heli Ruokamo - University of Lapland, Finland
Prof.Dr. Henry H.H. Chen - National pingtung university, Taiwan
Prof.Dr. Ing. Giovanni Adorni - University of Genova, Italy
Prof.Dr. J. Ana Donaldson - AECT President
Prof.Dr. J. Michael Spector - University of North Texas, USA
Prof.Dr. Jerry Willis - ST John Fisher University in Rochester, USA
Prof.Dr. Jie-Chi Yang - National central university, Taiwan
Prof.Dr. Kinshuk - Athabasca University, Canada
Prof.Dr. Kiyoshi Nakabayashi - Chiba Institute of Technology, Japan
Prof.Dr. Kumiko Aoki - The Open University of Japan, Japan

- Prof.Dr. Kuo - En Chang - National Taiwan Normal University, Taiwan
Prof.Dr. Kuo - Hung Tseng - Meiho Institute of Technology, Taiwan
Prof.Dr. Kuo - Robert Lai - Yuan - Ze University, Taiwan
Prof.Dr. Liu Meifeng - Beijing Normal University, China
Prof.Dr. Marina Stock McIsaac - Arizona State University, USA
Prof.Dr. Mehmet Ali Dikermen - Middlesex University, UK
Prof.Dr. Mehmet Çağlar - Near East University, TRNC
Prof.Dr. Mehmet Gürol - Fırat University, Turkey
Prof.Dr. Mehmet Kesim - Anadolu University, Turkey
Prof.Dr. Mei-Mei Chang - National pingtung university, Taiwan
Prof.Dr. Melissa Hui-Mei Fan - National central university, Taiwan
Prof.Dr. Min Jou - National Taiwan Normal University, Taiwan
Prof.Dr. Ming - Puu Chen - National Taiwan Normal University, Taiwan
Prof.Dr. Murat Barkan - Yaşar University, Turkey
Prof.Dr. Mustafa Murat Inceoğlu - Ege University, Turkey
Prof.Dr. Mustafa Şahin Dündar - Sakarya University, Turkey
Prof.Dr. Nabi Bux Jumani - International Islamic University, Pakistan
Prof.Dr. Nian - Shing Chen - National Sun Yat - Sen University, Taiwan
Prof.Dr. Paul Gibbs - Middlesex University, UK
Prof.Dr. Petek Aşkar - Hacettepe University, Turkey
Prof.Dr. Ramdane Younsi - Ecole polytechnique de Montreal, Canada
Prof.Dr. Ramzan Abacı - Istanbul Ticaret University, Turkey
Prof.Dr. Rauf Yıldız - Çanakkale 19 Mart University, Turkey
Prof.Dr. Roger Hartley - University of Leeds, UK
Prof.Dr. Rozhan Hj. Mohammed Idrus - Universiti Sains Malaysia, Malaysia
Prof.Dr. Saedah Siraj - University of Malaya, Malaysia
Prof.Dr. Sello Mokoena - University of South Africa, South Africa
Prof.Dr. Servet Bayram - Yeditepe University, Turkey
Prof.Dr. Shan - Ju Lin - National Taiwan University, Taiwan
Prof.Dr. Sheng Quan Yu - Beijing Normal University, China
Prof.Dr. Shi-Jer Lou - National pingtung university, Taiwan
Prof.Dr. Shu - Sheng Liaw - China Medical University, Taiwan
Prof.Dr. Shu-Hsuan Chang - National Changhua University of Education, Taiwan
Prof.Dr. Stefan Aufenanger - University of Mainz, Germany
Prof.Dr. Stephen Harmon - Georgia State University, USA
Prof.Dr. Stephen J.H. Yang - National Central University, Taiwan
Prof.Dr. Sun Fuwan - China Open University, China
Prof.Dr. Sunny S.J. Lin - National Chiao Tung University, Taiwan
Prof.Dr. Teressa Franklin - Ohio University, USA
Prof.Dr. Toshio Okamoto - University of Electro - Communications, Japan
Prof.Dr. Toshiyuki Yamamoto - Japan
Prof.Dr. Tzu - Chien Liu - National Central University, Taiwan
Prof.Dr. Ülkü Köymen - Lefke European University, TRNC
Prof.Dr. Vaseudev D.Kulkarni - Hutatma Rajjguru College, Rajguruunagar(Pune),(M.S.) INDIA
Prof.Dr. Xibin Han - Tsinghua University, China
Prof.Dr. Yau Hon Keung - City University of Hong Kong, Hong Kong
Prof.Dr. Yavuz Akpınar - Boğaziçi University, Turkey
Prof.Dr. Yen-Hsyang Chu - National central university, Taiwan
Prof.Dr. Yuan - Chen Liu - National Taipei University of Education, Taiwan
Prof.Dr. Yuan-Kuang Guu - National pingtung university, Taiwan
Prof.Dr. Young-Kyung Min - University of Washington, USA
- Assoc.Prof.Dr. Abdullah Kuzu - Anadolu University, Turkey
Assoc.Prof.Dr. Adile Aşkın Kurt - Anadolu University, Turkey
Assoc.Prof.Dr. Ahmet Eskicumalı – Sakarya University
Assoc.Prof.Dr. Aijaz Ahmed Gujjar - Sindh Madressatul Islam University, Pakistan
Assoc.Prof.Dr. Anita G. Welch - Ball State University, USA
Assoc.Prof.Dr. Aytaç Göğüş - Okan University, Turkey
Assoc.Prof.Dr. Chen - Chung Liu - National Central University, Taiwan
Assoc.Prof.Dr. Cheng - Huang Yen - National Open University, Taiwan

- Assoc.Prof.Dr. Ching - fan Chen - Tamkang University, Taiwan
 Assoc.Prof.Dr. Ching Hui Alice Chen - Ming Chuan University, Taiwan
 Assoc.Prof.Dr. Chiung - sui Chang - Tamkang University, Taiwan
 Assoc.Prof.Dr. Danguole Rutkauskienė - Kauno Technology University, Lietvenia
 Assoc.Prof.Dr. David Tawei Ku - Tamkang University, Taiwan
 Assoc.Prof.Dr. Eric Meng - National pingtung university, Taiwan
 Assoc.Prof.Dr. Eric Zhi Feng Liu - National central university, Taiwan
 Assoc.Prof.Dr. Erkan Tekinarslan - Bolu Abant İzzet Baysal University, Turkey
 Assoc.Prof.Dr. Ezendu Ariwa - London Metropolitan University, U.K.
 Assoc.Prof.Dr. Fahad N. AlFahad - King Saud University
 Assoc.Prof.Dr. Fahriye Altınay - Near East University, TRNC
 Assoc.Prof.Dr. Gurnam Kaur Sidhu - Universiti Teknologi MARA, Malaysia
 Assoc.Prof.Dr. Hao - Chiang Lin - National University of Tainan, Taiwan
 Assoc.Prof.Dr. Hasan Çalışkan - Anadolu University, Turkey
 Assoc.Prof.Dr. Hasan KARAL - Karadeniz Technical University, Turkey
 Assoc.Prof.Dr. Hsin - Chih Lin - National University of Tainan, Taiwan
 Assoc.Prof.Dr. Huey - Ching Jih - National Hsinchu University of Education, Taiwan
 Assoc.Prof.Dr. Huichen Zhao - School of Education, Henan University, China
 Assoc.Prof.Dr. Hüseyin Yaratın - Eastern Mediterranean University, TRNC
 Assoc.Prof.Dr. I - Wen Huang - National University of Tainan, Taiwan
 Assoc.Prof.Dr. I Tsun Chiang - National Changhua University of Education, Taiwan
 Assoc.Prof.Dr. Ian Sanders - University of the Witwatersrand, Johannesburg
 Assoc.Prof.Dr. İsmail İpek - Fatih University, Turkey
 Assoc.Prof.Dr. Işıl Kabakcı - Anadolu University, Turkey
 Assoc.Prof.Dr. Jana Birova - Comenius University in Bratislava, Slovakia
 Assoc.Prof.Dr. Jie - Chi Yang - National Central University, Taiwan
 Assoc.Prof.Dr. John I-Tsun Chiang - National Changhua University of Education, Taiwan
 Assoc.Prof.Dr. Ju - Ling Shih - National University of Taiwan, Taiwan
 Assoc.Prof.Dr. Koong Lin - National University of Tainan, Taiwan
 Assoc.Prof.Dr. Kuo - Chang Ting - Ming - HSIN University of Science and Technology, Taiwan
 Assoc.Prof.Dr. Kuo - Liang Ou - National Hsinchu University of Education, Taiwan
 Assoc.Prof.Dr. Larysa M. Mytsyk - Gogol State University, Ukraine
 Assoc.Prof.Dr. Li - An Ho - Tamkang University, Taiwan
 Assoc.Prof.Dr. Li Yawan - China Open University, China
 Assoc.Prof.Dr. Manoj Kumar Saxena - Central University of Himachal Pradesh, Dharamshala, Kangra, India
 Assoc.Prof.Dr. Mike Joy - University of Warwick, UK
 Assoc.Prof.Dr. Ming-Charn Jeng - National pingtung university, Taiwan
 Assoc.Prof.Dr. Murat Ataizi - Anadolu University, Turkey
 Assoc.Prof.Dr. Nergüz Serin - Cyprus International University, TRNC
 Assoc.Prof.Dr. Norazah Mohd Suki - Universiti Malaysia Sabah, Malaysia
 Assoc.Prof.Dr. Normaliza Abd Rahim - Universiti Putra Malaysia, Malaysia
 Assoc.Prof.Dr. Noushad Husain - Maulana Azad National Urdu University, Hyderabad
 Assoc.Prof.Dr. Oğuz Serin - Cyprus International University, TRNC
 Assoc.Prof.Dr. Ping - Kuen Chen - National Defense University, Taiwan
 Assoc.Prof.Dr. Popat S. Tambade - Prof. Ramkrishna More College, India
 Assoc.Prof.Dr. Prakash Khanale - Dnyanopasak College, INDIA
 Assoc.Prof.Dr. Pramela Krish - Universiti Kebangsaan Malaysia, Malaysia
 Assoc.Prof.Dr. Tzu - Hua Wang - National Hsinchu University of Education, Taiwan
 Assoc.Prof.Dr. Vincent Ru-Chu Shih - National Pingtung University of Science and Technology, Taiwan
 Assoc.Prof.Dr. Wu - Yui Hwang - National Central University, Taiwan
 Assoc.Prof.Dr. Ya-Ling Wu - National pingtung university, Taiwan
 Assoc.Prof.Dr. Yahya O Mohamed Elhadj - AL Imam Muhammad Ibn Saud University, Saudi Arabia
 Assoc.Prof.Dr. Yavuz Akbulut - Anadolu University
 Assoc.Prof.Dr. Zehra Altınay - Near East University, TRNC
 Assoc.Prof.Dr. Zhi - Feng Liu - National Central University, Taiwan
- Assist.Prof.Dr. Aaron L. Davenport - Grand View College, USA
 Assist.Prof.Dr. Alper Beyazıt - Yeditepe University, Turkey
 Assist.Prof.Dr. Andreja Istenic Starcic - University of Primorska, Slovenija
 Assist.Prof.Dr. Betül Özkan - University of Arizona, USA

Assist.Prof.Dr. Burçin Kısa Işık - Gaziantep University, Turkey
Assist.Prof.Dr. Chiu - Pin Lin - National Hsinchu University of Education, Taiwan
Assist.Prof.Dr. Chun - Ping Wu - Tamkang University, Taiwan
Assist.Prof.Dr. Chun - Yi Shen - Tamkang University, Taiwan
Assist.Prof.Dr. Chung-Yuan Hsu - National pingtung university, Taiwan
Assist.Prof.Dr. Dale Havill - Dhofar University, Sultanate of Oman
Assist.Prof.Dr. Devrim Akgündüz - İstanbul Aydın Üniversitesi, Turkey
Assist.Prof.Dr. Ferman Konukman - College of Arts and Science, Sport Science Program, Qatar University
Assist.Prof.Dr. Filiz Varol - Fırat University, Turkey
Assist.Prof.Dr. Guan - Ze Liao - National Hsinchu University of Education, Taiwan
Assist.Prof.Dr. Hsiang chin - hsiao - Shih - Chien University, Taiwan
Assist.Prof.Dr. Huei - Tse Hou - National Taiwan University of Science and Technology, Taiwan
Assist.Prof.Dr. Hüseyin Ünlü - Aksaray University, Turkey
Assist.Prof.Dr. Jagannath. K Dange - Kuvempu University, India
Assist.Prof.Dr. K. B. Praveena - University of Mysore, India
Assist.Prof.Dr. Kanvaria Vinod Kumar - University of Delhi, India
Assist.Prof.Dr. Lotfi Salhi - University of Gafsa, Tunisia
Assist.Prof.Dr. Marko Radovan - University of Ljubljana, Slovenia
Assist.Prof.Dr. Min-Hsien Lee - National central university, Taiwan
Assist.Prof.Dr. Mohammad Akram Mohammad Al-Zu'bi - Jordan Al Balqa Applied University, Jordan
Assist.Prof.Dr. Muhammet Demirbilek - Süleyman Demirel University, Turkey
Assist.Prof.Dr. Pamela Ewell - Central College of IOWA, USA
Assist.Prof.Dr. Pei-Hsuan Hsieh - National Cheng Kung University, Taiwan
Assist.Prof.Dr. Pey-Yan Liou - National central university, Taiwan
Assist.Prof.Dr. Phaik Kin, Cheah - Universiti Tunku Abdul Rahman, Kampar, Perak
Assist.Prof.Dr. Ping - Yeh Tsai - Tamkang University, Taiwan
Assist.Prof.Dr. S. Arulchelvan - Anna University, India
Assist.Prof.Dr. Seçil Kaya - Anadolu University, Turkey
Assist.Prof.Dr. Selma Koç Vonderwell - Cleveland State University, Cleveland
Assist.Prof.Dr. Sunil Kumar - National Institute of Technology, India
Assist.Prof.Dr. Tsung - Yen Chuang - National University of Taiwan, Taiwan
Assist.Prof.Dr. Vahid Motamedi - Tarbiat Moallem University, Iran
Assist.Prof.Dr. Wong Kung Teck - Sultan Idris Education University, Malaysia
Assist.Prof.Dr. Yalın Kılıç Türel - Fırat University, Turkey
Assist.Prof.Dr. Yasin Aslan - Sinap University, Turkey
Assist.Prof.Dr. Yu - Ju Lan - National Taipei University of Education, Taiwan
Assist.Prof.Dr. Zehra Alakoç Burma - Mersin University, Turkey
Assist.Prof.Dr. Zerrin Ayvaz Reis - İstanbul University, Turkey
Assist.Prof.Dr. Zülfü Genç - Fırat University, Turkey

Dr. Arnaud P. Prevot - Forest Ridge School of the Sacred Heart, USA
Dr. Balakrishnan Muniandy - Universiti Sains Malaysia, Malaysia
Dr. Brendan Tangney - Trinity College, Ireland
Dr. Chan Shiau Wei - Universiti Tun Hussein Onn Malaysia, Malaysia
Dr. Chen Haishan - China Open University, China
Dr. Chin Hai Leng - University of Malaya, Malaysia
Dr. Chin Yeh Wang - National Central University, Taiwan
Dr. Chun Hsiang Chen - National Central University, Taiwan
Dr. Chun Hung Lin - National central university, Taiwan
Dr. Esra Telli - Hacettepe University, Turkey
Dr. Farrah Dina Yusop - University of Malaya, Malaysia
Dr. Fatma Bayrak - Hacettepe University, Turkey
Dr. Gökhan Akçapınar - Hacettepe University, Turkey
Dr. Gökhan Dağhan - Hacettepe University, Turkey
Dr. Hj. Issham Ismail - Universiti Sains Malaysia, Malaysia
Dr. Hj. Mohd Arif Hj. Ismail - National University of Malaysia, Malaysia
Dr. I-Hen Tsai - National University of Tainan, Taiwan
Dr. İsmail İpek - Bilkent University, Turkey
Dr. Jarkko Suhonen - University of Eastern Finland, Finland
Dr. Li Ying - China Open University, China

Dr. Norlidah Alias - University of Malaya, Malaysia
Dr. Pinar Nuhoğlu - Hacettepe University, Turkey
Dr. Rosnaini Mahmud - Universiti Putra Malaysia, Malaysia
Dr. Sachin Sharma - Faridabad Institute of Technology, Faridabad
Dr. Seetharam Chittoor Jhansi - Pushpa Navnit Shah Centre for Lifelong Learning, India
Dr. Tam Shu Sim - University of Malaya, Malaysia
Dr. Tiong Goh - Victoria University of Wellington, New Zealand
Dr. Vikrant Mishra - Shivalik College of Education, India
Dr. Zahra Naimie - University of Malaya, Malaysia
Dr. Zari Sadat Seyyedrezaie - Islamic Azad University, Iran

Improving Educational Quality: Integration of a Graduate Tracer Automated System for an Academe <i>Dawn Iris CALIBO</i>	1
A Flipped Learning Design with Peer Instruction to Engage (Esl) Students <i>Hani ALHASANI, Fauzy Mohd WAN, Mona MASOOD</i>	9
Academic and Social Media Practices of Arabic Language Among Malaysian Students <i>Wail ISMAIL, Muhammad Azhar ZAILANI, Zakaria Alcheikh Mahmoud AWAD, Zaharah HUSSIN, Mohd FAISAL, Rahimi SAAD</i>	20
Active Methodologies for Improving Competencies in Project Management <i>Dante GUERRERO, Catherin GIRON</i>	35
An Instructional Design with Itunes U to Develop One-To-One Teaching Strategies in K12 Schools <i>Serhat GÜRGÜN</i>	50
An Investigation on the Acceptance of Mobile Learning (M-Learning) Among University Students in Hong Kong <i>Hon Keung YAU, Man Chung LEUNG, Hong Yin CHUNG</i>	57
Analysis of Symbolic Number Comparison Tasks in Terms of Numerical Stroop and Distance Effect <i>Yilmaz MUTLU, Sinan OLKUN</i>	86
Application of Virtual Reality Learning Environment to Enhance Graduate Student's Self-Directed Learning Skill <i>Nattaphon RAMPAI</i>	92
Applying Speech Analysis Software to Linguistic Research: A Case Study on Pause Patterns <i>Ömer EREN, Mehmet KILIÇ, Erdoğan BADA</i>	99
Awareness Integration: A Non-Invasive Recovery Methodology in Reducing College Students' Anxiety, Depression, and Stress <i>Foojan ZEINE, Nicole JAFARI, Mohammad FOROUZESH</i>	105
Blended E-Learning Acceptance as Smart Pedagogical Tools: An Initial Study in Malaysia <i>Kung-Teck, WONG, Mohd Sahandri Gani HAMZAH, Pauline Swee Choo, GOH, Mohd Azli b. YEOP</i>	115
Blended Learning Components Important to Student Learning: A Study on the Perceptions of Instructors <i>Minh Hien VO, Chang ZHU, Nguyet Anh DIEP</i>	123
Comparison of Learning Motivation Affected by Vector Infographic and Bitmap Infographic <i>Boonjira WONGPA, Sasichai TANAMAI, Watsatree DITEEYONT</i>	131
Computer-Based Learning: E-Learning <i>Bih Ni LEE</i>	137
Considerations for Implementing Websites with Greater Accessibility for People with Visual Impairment <i>Carlos Oswaldo URGILES-CEDENO, Franklin Alberto CONZA APOLO, Jorge MAZA, Jennifer Celleri PACHECO</i>	146
Delete False Dichotomies, Enter Conjugate Qualities <i>Ali BAYKAL</i>	154
Designing and Developing a Web Application Aor Learning Geography <i>Antonina PLUTINO, Stefano DI TORE, Flora IPPOLITO</i>	164
Development of Printed Media with Augmented Reality Technology for the Farmers in Rural Areas Nakhon Nayok Provinces, Thailand	175

Paitoon SRIFA, Wilaiporn POOKEAMKAM

Digital Teacher Competence <i>María Luz CACHEIRO-GONZÁLEZ, Cristina SÁNCHEZ-ROMERO, GONZÁLEZ-LORENZO</i>	180
Educational Robotics: Forming Scientific Communities in the Classroom <i>Julio ENCALADA CUENCA, Sara CRUZ NARANJO, Marcos ARBOLEDA BARREZUETA, SAMANIEGO OCAMPO, Birmania JIMÉNEZ VILLAMAR</i>	191
Effective Affective Communication in Online Learning Environments: Social Presence Professor <i>David Mykota, Deighan Remoundos Doctoral Candidate</i>	198
Effectiveness of Using Stop, Think and Talk Activities on the Performance of Students in Reading Comprehension in Junior Secondary Schools in Federal Capital Territory (Fct) Abuja <i>Hanna Onyi YUSUF</i>	211
Effects of Health Education on Cigarette Smoking Habits Among Health Professional Students <i>Elif DEMIRKIRAN, Hülya GÜL</i>	217
E-FSDP: A Project-Based Development of a Decision Support System for Monitoring the Seminars and Training Programs of FAITH's Faculty and Staff <i>Alice M. LACORTE, Jonathan M. CABALLERO</i>	224
Emotional and Social Intelligence Against Inertia <i>Okan ŞENELDİR, Hüseyin SOYDAŞ, Yaşar GENEL, Üzeyir AKÇA, Mustafa KUDU, Sinan AYDIN</i>	229
English Language Teaching in Ecuador: An Analysis of its Evolution within the National Curriculum of Public Primary Schools <i>Sandy T. SOTO, Eder INTRIAGO, Estefanía VARGAS CAICEDO, Maricela CAJAMARCA ILLESCAS, Silvia CARDENAS, Paolo FABRE MERCHAN, Israel BRAVO, María Antonieta MORALES, Jhonny VILLAFUERTE</i>	235
Enhancing English Speaking Interaction in Future Foreign Language Teachers: Case Study Corrective Feedback through Google Sheets <i>Eder INTRIAGO, Jhonny VILLAFUERTE, María Antonieta MORALES, Vanessa MENDOZA</i>	245
Enhancing the Online Experience: Improving Faculty Interactions in Blended Delivery <i>Dalton MERVOLD</i>	257
E-Portfolio Paradigm: Basis for Developing an Academic Conceptual Framework Tertiary Learning Performance <i>Arlene R. CABALLERO</i>	262
Evaluation of the Quality of Ecuadorian University Websites <i>Carlos VEGA, Jennifer CELLERI-PACHECO, Jorge MAZA-CORDOVA</i>	270
Examining the Relationship Between Tendency of Reflective Thinking and Reflection Abilities of Physical Education and Sports Teachers <i>Adem SOLAKUMUR, Murat KUL, Gülten HERGÜNER</i>	285
Exploring the Potential Relationships Between Teaching Materials and Student Motivation <i>Koji UENISHI</i>	294
Fear of Missing Out at Adolescents and Academic Burn Out and School Drop Outs in Turkey <i>Ezgi AGCIHAN</i>	304
Five Stages for Design and Establishing an Effective MOOC SYSTEM <i>Amer Saleem ELAMEER, Raghad Basem MAHMOOD</i>	314

Flipped Learning for Esl Writing in a Sudanese School <i>Limia Ali Mohamed ABDELRAHMAN, Dorothy DEWITT, Norlidah ALIAS, Mohd Nazri ABDUL RAHMAN</i>	324
Flipping the Classroom through the Use of Socrative, Padlet, and Twitter in an Academic Writing Course: A Case of Pre-Service EFL Teachers in Ecuador <i>Paola CABRER, Luz CASTILLO</i>	331
Formulating Learning Method in Higher Education for Global Readiness <i>Martani HUSEINI, Eko SAKAPURNAMA, Retno KUSUMASTUTI</i>	337
Fostering Students' Creativity by Designing Their Own Periodic Table <i>Karntarat WUTTISELA</i>	344
Gender Difference in the Use of Learning Strategies: A Pakistani Perspective <i>Shahida SOHAIL</i>	349
Global Transfer of 'the Ugly Indian' Project for the Values Formation <i>Fernanda TUSA, Tomas FONTAINES-RUIZ, Eduardo TUSA</i>	353
Helping Students Write Better Sociology Essays Using Concept Maps <i>Nawal Adibah KASSIM, Jainatul Halida JAIDIN, Rosmawijah JAWAWI, Rohani MATZIN</i>	360
Heuristic Test of Structure and Content Writing of the Websites <i>Leandro LUDENA-APOLO, Jennifer CELLERI-PACHECO, Jorge MAZA-CORDOVA</i>	370
How Can Students Contribute to Their Own Learning with Ict: The Opportunities and Challenges with 1:1 Tablets in Education <i>Serpil TUTI SARI</i>	381
How Does Explaining Content Through Videos Benefit Language Learners? Esp Students Tell us About it. <i>Sandy T. SOTO, Ligia Fernanda ESPINOSA, Estefania VARGAS CAICEDO, Cajamarca ILLESCAS, Tomás FONTAINES-RUIZ, Venezuela David CARRERA</i>	385
Impact of Online Homework on Students' Performance and Work Habits in Chemical Education <i>Samir EL HAJJAJI, Abdelkrim OUARDAOUI</i>	392
In-Service Teacher Training Needs Among Basic Education Teachers <i>Cristie Ann Jaca DELFIN, Felino B. JAVINES JR.</i>	401
Integrated Media Utilization for Creative Tourism Promotion in Bangkok Neighboring Area Nonthaburi, Pathum Thani, and Ayutthaya Provinces <i>Narong SOMPONG, Nattaphon RAMPAL, Cherdpong KHEERAJIT</i>	407
Investigating the Impact of Game-Based Learning on Student Engagement and Performance When Learning About Earthquake Hazards <i>Jainatul Halida JAIDIN, Juraidah MUSA, Mohd Redzuan ZAINUDDIN</i>	413
Investigation of Sleep Quality Parameters Tt Improve Cognitive Performance in Classroom Tests <i>Alisa FUKUDA, Robin GARHWAL</i>	424
Iranian ESL Students' Language Learning Strategies: A Look at Proficiency, and Gender <i>Mojtaba GHOLAMIAN, Mehrdad TIMACHI, Afshin KHAFI, Raha SOLEYMANI</i>	431
Kenocod: A New Kind of Quizzing Tool for Game-Based Learning in Coding Interview Preparations <i>Vinodh Kumar SUNKARA, Susmitha SUNKARA, Jyothsna TALACHUTTLA</i>	440

Language Teacher Training Program Evaluation Using a Mixed Method: A Case Study of a Korean in-Service Teacher Training Program <i>Yoonhee CHOE</i>	449
Learning by Designing: Investigating New Didactic Methods to Learn Architectural Design <i>Giuseppe FALLACARA, Maurizio BARBERIO, Micaela COLELLA</i>	455
Link and Match Learning Outcomes of Entrepreneurial Competencies Required in Indonesian Companies <i>Muhammad Naufal ABDILLAH, Eko SAKAPURNAMA</i>	466
Link and Match Learning Outcomes of Entrepreneurial Competencies Required in Indonesian Companies <i>Muhammad Naufal ABDILLAH, Eko SAKAPURNAMA</i>	473
Machine Learning in the Medical Field for Decision Making <i>Bohra TRIQUI, Abdelkader BENYETTOU</i>	481
Mathematics Lessons within a Learning Environment Enriched with Teaching Materials: A Phenomenology Study <i>Nezih ÖNAL, Nagihan TANIÖ ÖNAL</i>	489
Media-Text - As Powerfull Means of Mass Media <i>Esenova O.KALBIKE, Amirbekova B.AIGUL, Seidaliyeva O. GULDANA</i>	496
MAVIS: Special Education Virtual Assistant <i>Eliza D. MAPANOO, Jonathan M. CABALLERO</i>	505
An Exploratory Study: Undergraduates' Perceptions Towards E-Learning Platforms in English Language Teaching (Elt) in Ecuador. <i>Paolo FABRE-MERCHÁN, Bradley BURENHEIDE, Eder INTRIAGO-PALACIOS, M.Antonieta MORALES-JARAMILLO, M.Veronica MORALES-JARAMILLO</i>	513
Mobile Devices Change the Way of Taught, Learned and Practiced <i>Bih Ni LEE</i>	520
Not a Burden Any More: Completion Tasks as an Alternative Format of Test Practice in Complex Learning Hyun <i>JOO Chungsoo NA, Jinju LEE, Joeun CHOI, Dongsik KIM, Jihoon SONG</i>	532
Online Course Evaluation System Adoption in Higher Educational Institutions: Evidence from an Emerging Country <i>Augustus Barnnet ANDERSON, Richard BOATENG, Eric ANSONG</i>	540
Online Interaction Quality Among Adult Learners: The Role of Sense of Belonging and Perceived Learning Benefits <i>Anh Nguyet DIEP, Celine COCQUYT, Chang ZHU, Tom VANWING</i>	551
Open Source Software for Analysis and Correlation of Reading Patterns with Superior Sat Scores Using Gaze-Tracking Device <i>Andrew HOWE, Phong NGUYEN</i>	560
Perception of Secondary School students about Learning Difficulties and Misconceptions in basic concepts of Chemistry <i>Rizwan Akram RANA, Tayyaba M. AKRAM, Anam ILYAS, Aisha SAMI, Hamid IKRAM, Asim NAZIR, Sidra MUJAHID</i>	567
Physical Education with the Ict for Constructivist Learning <i>Naoki SUZUKI, Seiji OKUMA, Satoshi ISHIZUKA, Takayuki ABE, Yasutaka OHTA, Hironobu MASUDA</i>	575

Possibilities and Risks of Using Literary Texts in Second Language Teaching <i>Yılmaz DAŞCIOĞLU</i>	581
Postgraduate Courses on a Virtual Classroom Platform <i>Ömer EREN, Tuçe ÖZTÜRK, Cengiz TURAN, Erdoğan BADA</i>	585
Reinterpreting the Flesch Readability Scale for the Information Age <i>Jan E.J. STEWART</i>	591
Research into the Effect of Special Course with Positive Emotion about the Creative Design of Fuel-economizing Device on University Students' Creativity Development in the Department of Engineering <i>Shi-JerLOU, Wei-Yuan DZAN, Tsai-Feng CHENG, Chih-Chao CHUNG</i>	599
Rise and Fall of Massive Open Online Courses: Implications of Limitations in Teaching and Evaluation Processes <i>Stephen John BEAUMONT</i>	613
Safelabs the Safe Education and Internet Surfing in Computer Labs for People with Intellectual Disability <i>Ana Luísa Mateus Oliveira CHANÇA TORRES, Sérgio COELHO, José Maurício DIAS, Anna KWIATKOWSKA</i>	617
Serious Game as a Way to Boost Self-Regulated Learning in Higher Education <i>Rosemary SAMANIEGO OCAMPO</i>	625
Share and Teach: A New Interactive Way of Designing Teaching Materials on Different Devices <i>Laura GIRALDI, Romina NESTI, Lara MUSA</i>	631
Strategies Adopted by Esp Students to Perform Oral Presentations Through Videos <i>Sandy T. SOTO, Estefanía VARGAS CAICEDO, Maricela CAJAMARCA ILLESCAS, Ligia Fernanda ESPINOSA, Ketty HONORES, Tomás FONTAINES-RUIZ</i>	646
Study on the Capacity and Readiness to Implement Information Technology of Personnel in Higher Educational Institutions to Drive Thailand's Education Reform 4.0 <i>Sasichai TANAMAI</i>	655
Tax Education Program for Teachers in High Schools to Enhance Voluntary Tax Compliance <i>Sutrisno, Milla Sepliana SETYOWATI</i>	662
Teachers' Use of Information and Communications Technology in Education: Cameroon Secondary Schools Perspectives <i>Shaibou Abdoulai HAJI, Gracemary Elohenke MOLUAYONGE, Innwoo PARK</i>	671
Technology and the Achievement Gap an Educator's Leadership Plan for Action with Training <i>Timothy J. BELLOFF SR, D.Bruce CAMPBELL JR</i>	680
Terrain Area Estimation by Using Polygons Based on Visual Lisp <i>Marco TACURI, Eduardo TUSA, César SOLANO</i>	688
The 'Booktuber' Practice as a Teaching-Learning Medium in Journalistic Writing Classes <i>Fernanda TUSA, Tomas FONTAINES-RUIZ, Eduardo TUSA</i>	697
The Behaviors Create Innovation on Social Networks in Multimedia Technology of Undergraduates <i>Sirikan CHAIYASIT</i>	708
The Development of Interactive Multimedia Learning Pyramid and Prism for Junior High School Using Macromedia Authorware <i>Juhriyansyah DALLE, Sutarto HADI, Baharuddin, Nurlaila HAYATI</i>	714
The Educational Qualification of Social Media: A Search for a New Public Sphere	722

Ayhan DOLUNAY, Çağdaş ÖĞÜÇ, Fevzi KASAP

The Effect of Structure in Flipped Classroom Designs For Deep and Surface Learning Approaches 732
Fatma Gizem KARAOĞLAN YILMAZ, H. Tuğba ÖZTÜRK, Ramazan YILMAZ

The Effects of Smartphone Addiction Marital Adjustment of Partners 751
Hatice KUMCAĞIZ, Cengiz ŞAHİN, Berna KÖKSAL

The Impact of Assistive Technology on Down Syndrome Students in Kingdom of Bahrain 759
Jaflah ALAMMARY, Fatima AL-HAIKI, Kawther AL-MUQAHWI

The Impact of Fonf Instruction Through Blended Learning on the Students' Meaning Negotiation and Grammar Skills 779
Hee Yeon KANG, Chung Hyun LEE

The Impact of Principles in Learning and Teaching of Professional English in Multilin-Gual Context 794
Saltanat MEIRAMOVA, Damina SHAIBAKOVA

The Influences of Musical Learning on Psycho-Physical Development, Intelligence and Technology 801
Giusi Antonia TOTO

The Representation of the Victim as a Social Construction in Court News 808
Çağdaş ÖĞÜÇ, Ayhan DOLUNAY, Fevzi KASAP

The Specific Situation of Vocational Education in Hungarian Language in Romania: Ict Vs. E-Learning 818
Katalin HARANGUS, Zsófia-Irén HORVÁTH, Erzsébet SZENTES

The Uses of Augmented Reality in Learning Sciences: A Review 826
Kumar Ravinder GILL

Training of Students-Philologists the Methods of Conducting Content Analysis 834
Mussatayeva Manatkul SHAYACHMETOVNA, Kumatova Gulzira ABIBUKIROVNA, Nussupbekova Aizhan SEYSENALOVNA, Yesirkeyeva Dinara AYDAROVNA

Types of Behavior in Businesses and Resistance to Individual Change 843
Okan ŞENELDİR, Mustafa KUDU, Yaşar GENEL, Üzeyir AKÇA, Hüseyin SOYDAŞ, Sinan AYDIN

Using Electronic Information Resources Centers by Faculty Members at University Education: Competencies, Needs Aad Challenges 849
Abouelenein, Yousri Attia MOHAMED

Using Facial Recognition Technology in Smart Attendance Application 878
Greg CROW, Alec BLAGG, Emil BALIAN, Phong NGUYEN

Using R in Conducting Multivariate Analyses Based on Data Summaries of Published Research 884
Mehmet TÜREGÜN

Using Technology Devicesto Improve College Students' English Learning Outcomes 896
Ju Yin YANG

Using Timestamps for an Effective Utilization of Video Content and the Construction of its Platform 906
Shinya MIZUNO, Masashi URAMATSU, Takahiro SOUMA, Haruka OHBA, Yoshikazu FUJISAWA

Value-Based Interactive Multimedia Development through Integrated Practice for the Formation of Students' Character 912
Kokom KOMALASARI, Didin SARIPUDIN

Vestiges of Digital Citizenship in Students of a Mexican University 920
Carlos Arturo TORRES-GASTELÚ, Joel ANGULO-ARMENTA, Agustín LAGUNES-DOMÍNGUEZ, Jose Luis SOTO-ORTÍZ

Web-Conferencing: Interactive, Engaging, and Collaborative Online Learning <i>Linda ALLEN, William YOUNG, Kim WARFIELD</i>	929
What are the Opinions of Prospective Science Teachers Regarding the Use of Technology in Education? <i>Nagihan Tanik ÖNAL, Nezih ÖNAL, Uğur BÜYÜK</i>	938
Microlearning: A Pedagogical Approach for Technology Integration <i>Emtinan ALQURASHI</i>	942
Evaluating the Leadership Behaviours of the School Principles According to Teachers' Work Satisfaction <i>Behcet ÖZNACAR, Ercan SÜSLÜ</i>	948
The Relation Between Ethical Leadership and Organizational Justice in School Administration <i>Behcet ÖZNACAR, Hüseyin GÖLGE</i>	960
Evaluation of School Executives' and Teachers' Views Related to School Executives Exhibition Leadership Behaviors <i>Behcet ÖZNACAR, Şerife PARLAKTEPE GAZİLER</i>	972
Evaluation of Teacher's Visits of the School Administrator's Leadership Styles <i>Behcet ÖZNACAR, Halil GAZİLER</i>	984

Improving Educational Quality: Integration of a Graduate Tracer Automated System for an Academe

Dawn Iris CALIBO

Siquijor State College

dawniris_19@yahoo.com

Jonathan M. CABALLERO

Technological Institute of the Philippines (T.I.P.)- Manila

jonathan.caballero@gmail.com

ABSTRACT

Technological advancement has offered the field of instruction more practical tools to upgrade quality in education. This tool includes the capability of tracking down graduates as team players in the real world of employment to assess if the educational institution has provided them with the necessary training and skills needed to become employable graduates. In this study, quality and effectiveness of the graduate tracking tool are assessed for the assurance of quality outcome from the system that leads to better decisions on future developments. Using a research questionnaire based on published literature on the information system, the researcher determined the quality of the existing graduate tracer system for the college. The study reveals that the entities such as System Quality, Information Quality, and Service Quality contribute to the effectiveness based on the system's quality. Thus, with the data on hand, the findings show that there is user satisfaction that makes it effective for the state college to integrate the alumni tracer system.

INTRODUCTION

A Graduate Tracer Study is among the requirements of the Commission on Higher Education to evaluate and determine the relevance of the country's educational institutions. A tracer study is an alumni survey used to trace the activities or the employment status of an educational institution, (Milington, C., 2006). It also examines and evaluates the current and career and future job opportunities for graduates. Additionally, the tracer study is a tool that aims to point out the strength and weaknesses of a program through an alumni evaluation tool. The feedback could help the system traced back elements of the program that needs to improve. Schomburg as well said that graduate studies are accessible for the "analysis of the relationship between higher education and work." It can provide employment data of the graduate. The study reveals relevant data on the question "Where are our graduates now" and information on the status of the graduate's employment. Schomburg continues that information "about the kind of work task the relationship between study and labor, and professional values and job satisfaction." is provided as well, (Schomburg, 2003).

In fact, in one research, competitiveness in Central Java Indonesia allows the school to develop strategies to achieve excellent education and produce employable graduates. It later becomes a way to school to develop a branding strategy in higher education as stated by Nelloh, (2010).

Siquijor State College (SSC) is the only state-owned Higher-Educational Institution (HEI) in the province of Siquijor that provides efficient and excellent education. It has produced graduates for several years since its conversion from a vocational into a state college. With this, the need for the adoption of a graduate tracer system to track down graduates has emerged.

As a faculty member of the College of Technology, the researcher helps develop a graduate tracer system to help solve the problems encountered by the institution in tracking down its graduates and provide feedbacks about their status of employment. With the system on hand, this study further seeks the assessment of the system's quality and effectiveness to its users.

THE STUDY

This study is supported by Cognitive Flexibility Theory developed by Rand J. Spiro, et. al. (1990). The theory deals with the advance attainment of knowledge that introduced "flexible reassembly of preexisting knowledge to fit the needs of a new situation." (Sprio, J., et. al., 1991). The theory also explains that the cognitive flexibility theory intends to promote the learners' ability to reconstruct their knowledge continually and adapt according to the situational demands, (Sprio, J., et. al., 1990). Spiro & Jehng emphasized that to achieve the learner's cognitive flexibility is to control the way that learning speaks to and the procedure that works those mental portrayals, (Spiro, J., et. al., 1991). As Boger (2007), puts it, this is essential to the success of the learner in both academe and life. The part of cognitive flexibility in instruction is on how students are educated necessarily impacts the development of their psychological structures that influence understudies' capacity to store data. The purpose of teaching, hence, is to help learners apply their knowledge and adapt their learning to different situations.

However, the role of the school does not end once students graduate. That is why the government mandates that all academic institutions conduct a graduate tracer study to get information from graduates. This data might be substantial for the advancement of the school with regards to quality affirmation.

Guasa (2008) held an alumni tracer system based on social networking Process for Southern Leyte State University (SLSU). It shows that the method of processing the data from the alumni tracer study conducted using manual method be set problems based on the answer of the respondents. With the help of the interviewees, Guasa was able to design and develop SLSU Member Network System (SANS) known as a dynamic web-based program that eases the process of tracing and monitoring graduates. Technology has accomplished its most essential part in enhancing the quality of training. It is prevailing with regards to modernizing the procedure of abilities learning. Presently, technology introduces the internet system for advance communication. The Internet is a vast network that connects smaller networks all over the globe. Currently, the Internet and the Web have evolved into one of the most powerful tools of the 21st century.

The World Wide Web (WWW) in relation with data innovation has discovered numerous applications and turn into an intense, intuitive, and dynamic medium for conveying data. One well-known application has been for instructive utilize, for example, Web-based learning frameworks. As Shelly puts it, the educational website offers challenging avenues for formal and informal teaching and learning, (Shelly, et. al., 2010). Uy, likewise observes that the digital empowerment is becoming stronger the Philippines. Information and Communication Technology (ICT) now serves as an active tool for various countries especially in developing states for strengthening the government and quality of social services, (Uy, 2011).

With the adoption of the state college of the graduate tracer system, a framework must be used to evaluate the systems' quality and effectiveness through the updated information systems success model (DeLone & McLean 2002, 2003). Information systems success is a standout among the most generally utilized ward factors in information system (IS) research. To give a general and extensive meaning of IS achievement that spreads alternate points of view of assessing data frameworks, DeLone and McLean checked on the current definitions of IS success relating measures and grouped them into six general classes.

Consequently, they made a multidimensional measuring model with cross dependencies between the diverse achievement groups. Thus, the researchers consider incorporating the Updated Information System Success Model to the research's investigation findings to create a broad framework.

The said model is composed of six (6) aspects of IS success namely such as information, system and service quality, use, user satisfaction, and net benefits. The arrows exhibit proposed a relationship between the achievement measurements. The model can be deciphered as takes after: A framework can be assessed on data, context, and administration quality; these attributes influence the ensuing use or goal to utilize and client satisfaction. Accordingly, of using the framework, certain advantages will be accomplished. The clear advantages will (emphatically or adversely) impact customer satisfaction and the further utilization of the data structure.

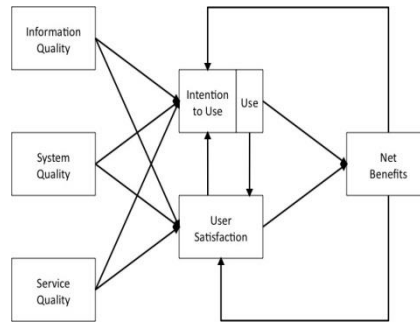


Figure 1. Updated Information Systems

McLean (2003)

Success Model by DeLone &

In the work of Pitt et al. the Updated Information Systems Success Model by DeLone & McLean was customized to cater customer return settings. The IS framework has been trimmed down to form three quality dimensions that lead to the overall effectiveness of the system, (Acton, et. Al., (2010).

The adjusted structure is represented in the graphical representation as follows:

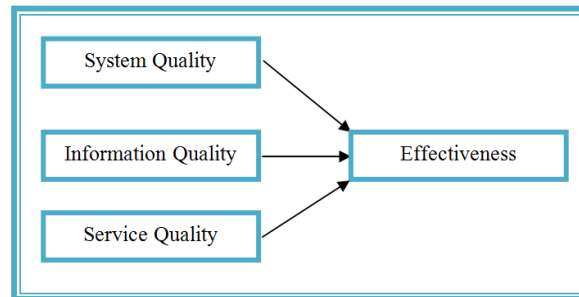


Figure 2. The Factors on Quality of Graduate Tracer Systems' Effectiveness

Hence, the study has adopted this model to determine the effectiveness of a Graduate Tracer System based on multi-level marketing system. The model is consist of different measurements such as network quality which deals with user requirements and satisfaction, information quality which relates to the value of information and service quality which deals about system's performance opposed to users expectation.

METHODOLOGY

The research uses the quantitative approach since it gears to investigate phenomena using statistical data which is treated using mathematical techniques. It uses a survey questionnaire to measure the effectiveness of a Graduate Tracer System. There are 40 respondents identified to participate in the evaluation. During the administration of the questionnaires, the participants are oriented to the different items in the survey so that they will be able to answer it correctly.

After data retrieval, the Likert's scale was used to evaluate the user satisfaction of the software which is followed by the data interpretation.

a. Survey Questionnaires

The adopted survey questionnaire used in the research is composed of four constructs with twenty-one (21) measurements. For System quality, its parameters include navigation and response time, design, system security and availability, functionality and error free transactions. For information quality, the parameters are content variety; complete and detailed information; accurate, reliable and timely information following the appropriate format. Regarding service quality, the parameters include responsiveness, reliability, confidence, empathy, follow-up service and competence. And lastly, to get satisfaction, it was measured by user acceptance only.

Therefore, the parameters used to measure the effectiveness of the Graduate Tracer System adopted by the state college in the survey questionnaire are justifiable. For the analysis, the survey results are treated using a Likert scale with the interpretation of Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree to denote the users' level of agreement or disagreement on the software survey items.

Table 1. Survey Questionnaire on the Effectiveness of the Graduate Tracer System

Construct	Measures	Questionnaires
System Quality	Design	• It has an appropriate design for business type
	Navigation Response	• It has an easy navigation to information
	Response Time	• It has fast response and transaction processing
	System Security	• It transactions secure from exposure
	System Availability	• I can use it when I want to use it
	Functionality	• It has a good functionality relevant to site type
	Error Free Transaction	• It keeps error-free transactions
Information Quality	Content Variety	• It has sufficient contents which I expect to find
	Complete Information	• It provides complete information
	Detail Information	• It provides detailed information
	Accurate Information	• It provides accurate information
	Timely Information	• It provides timely information
	Reliable Information	• It provides reliable information
	Appropriate Information	• It communicates information in appropriate format
Service Quality	Responsiveness	• It anticipates and responds promptly to user request
	Reliability	• It can be depended on to provide whatever is promised
	Confidence	• It instils confidence in users and reduces uncertainty
	Empathy	• It understands and adapts to the user's needs
	Follow-Up Service	• It follow-up service to users
	Competence	• It gives a professional and competence image
Satisfaction	User Acceptance	• My overall satisfaction level with regards to the performance evaluation I use is better than what is expected
		• My overall satisfaction level with regards to the performance evaluation I use is better than I thought it

RESULTS AND DISCUSSION

The research survey is done out of 40 respondents as it assesses as far as its system, information quality, service quality and user satisfaction based on the creation of the research questionnaire. The data are as follows:

A. Table 2. System Quality

Construct	Measures	Questionnaires	Mean
System Quality	Design	It has an appropriate design for business type	4.53
	Navigation Response	It has an easy navigation to information	4.50
	Response Time	It has fast response and transaction processing	4.38
	System Security	It transactions secure from exposure	4.13
	System Availability	I can use it when I want to use it	4.06
	Functionality	It has a good functionality relevant to site type	4.36
	Error Free Transaction	It keeps error-free transactions	4.28
Average Mean			4.32

Table 2 shows the respondents assessment on system quality of alumni tracer system of the state college. The table indicates that the respondents strongly agreed on the system design, navigation response, response time functionally and error-free transaction as supported by the mean (M=4.53, M=4.50, M=4.38, M=4.36, and M=4.28) respectively. Alternatively, the table shows that among the bottom two are system security and system availability with the mean (M=4.13 and M=4.06) and has a written description of Agree.

With the average mean of M=4.32, the respondent strongly agreed that the system is of high quality. Thus, the application has a desirable trademark on its ease of use and execution.

B. Table 3. Information Quality

Construct	Measures	Questionnaires	Mean
Information Quality	Content Variety	It has sufficient contents which I expect to find	4.26
	Complete Information	It provides complete information	4.43
	Detail Information	It provides detailed information	4.46
	Accurate Information	It provides accurate information	4.32
	Timely Information	It provides timely information	4.60
	Reliable Information	It provides reliable information	4.26
	Appropriate Information	It communicates information in appropriate format	4.21
Average Mean			4.36

Table 3 illustrates on the information quality of the system. The result shows that the Respondent has strongly agreed that the system generates content variety, complete, detailed, accurate, timely, reliable and appropriate information with the mean (M=4.26, M=4.43, M=4.46, M=4.32, M=4.60, M=4.26, M=4.36), correspondingly. The average mean when it comes to information quality is 4.36 with a verbal description of strongly agrees supports the findings that the information generated by the system is relevant and consistent.

C. Table 4. Service Quality

Construct	Measures	Questionnaires	Mean
Service Quality	Responsiveness	It anticipates and responds promptly to user request	4.38
	Reliability	It can be depended on to provide whatever is promised	4.40
	Confidence	It instils confidence in users and reduces uncertainty	4.43
	Empathy	It understands and adapts to the user's needs	4.01
	Follow-Up Service	It follow-up service to users	4.21
	Competence	It gives a professional and competence image	4.56
Average Mean			4.33

For table 4, the result demonstrates that regarding system quality, the respondents strongly agreed on the system responsiveness, reliability, confidence, follow-up service and competence as supported by the mean (M=4.38, M=4.40, M=4.43, M=4.21 and M=4.56) altogether. On the other hand, the table further exemplifies that only empathy ranks last with the mean M=4.01 and has the verbal description of agree from the respondents. The average mean of M=3.32 the result illustrates that the respondent strongly agreed that the users are satisfied with the system's implementation.

D. Table 5. Customer Satisfaction

Construct	Measures	Questionnaires	Mean
Satisfaction	User Acceptance	My overall satisfaction level with regards to the performance evaluation I use is better than what is expected	4.55
		My overall satisfaction level with regards to the performance evaluation I use is better than I thought it	4.68
Average Mean			4.62

In Table 5 the study reveals the customer's satisfaction. As a principle in business, "the customer is always right". Thus, the providers must always put into consideration on the prospect customers preference when making products or conceptualizing services. The table shows that the respondents has a high overall satisfaction with the mean of (M=4.55 and M=4.68) and is further supported by the average mean of M=4.63.

The result clearly provides evidence that the implementation of the alumni tracer system is effective.

FINDINGS

The previous study shows that web benefit has been utilized in different areas. It adeptly includes the field of education. However, to assure that the system is well-structured and sustainable, a regular and continues monitoring and assessment is needed, (Benatallah, et. Al., 2002), (Fotrousi, F. (2016).

The result of this study is deemed to encourage the higher educational institution to adopt more technologically advanced tool such as an alumni tracer system that could help them track down graduates as it could provide them with relevant information that could be used to augment practices inside the institution. The result further shows a deeper understanding of the measurement of the quality and effectiveness of an alumni tracer system application.

CONCLUSION

The direction of this study is to evaluate the effectiveness of an alumni system web based application developed using PHP Framework. In general, this paper demonstrates that administration quality is the priority of the respondents having the most noteworthy gotten average mean of 4.62. Then again, System Quality is practically identical with Information Quality with an understanding of strongly agree. With the aggregated mean of 4.41, the review concluded that the application is compelling in perspective of the way that it could accomplish its goals inside the predetermined condition.

The continuous search for improving educational quality is a general thrust of all educational institutions. With the advancement of information and technology, it is but necessary that institutions of higher learning continually embraced this technology. However, on the implementation, the effectiveness of this innovative tool must regularly be evaluated to maintain clientele satisfaction and quality assurance as a whole.

REFERENCES

- Acton, Thomaset.al (2010). *The influence of quality on e-commerce success: an empirical application of the Delone and Mclean IS success model*.
- Boger-Mehall, S. (2007), Cognitive flexibility theory: implications for teaching and teacher education. Retrieved November 18, 2012 from www.google.com
- Guasa, Czarina Angella V. (2008). *An alumni tracer system based on social networking method for Southern Leyte State University (SLSU)*. Southern Leyte.
- pedia of qualitative research methods*. Los Angeles, Calif.: Sage Publications. ISBN 1-4129-4163-6.
- Benatallah, B., & Casati, F. (2002). *Distributed and parallel database, special issue on web services*.
- DeLone, W.H., and McLean, E.R. 1992. *Information systems success: The quest for the dependent variable*. Information Systems Research (3:1), pp 60-95.
- DeLone, W.H., and McLean, E.R. 2002. *Information systems success revisited*. Proceedings of the 35th Hawaii International Conference on System Sciences (HICSS 02). Big Island, Hawaii: pp. 238-249.
- DeLone, W.H., and McLean, E.R. 2003. *The DeLone and McLean model of information systems success: a ten-year update*. Journal of Management Information Systems (19:4), Spring, pp 9-30.
- Fotrousi, F. (2016). *Quality-Impact assessment of software systems. in requirements engineering conference (RE)*, 2016 IEEE 24th International (pp. 427-431). IEEE.
- Given, Lisa M. (2008). *The Sage encyclo*
- Milington, C. (2006), *The use of tracer studies for enhancing relevance and marketability in online and distance education*. Retrieved December 2012 from hgrmill@sunbeach.net
- Schomburg, H., (2003). *Handbook for graduate tracer studies*. Retrieved at: http://www.qtafi.de/images/schomburg/schomburg_2003_tracer_handbook_v2.pdf Retrieved on : November 18, 2012
- Nelloh, L. (2010), *Do the educational service characteristics and perceptions matters to intention to recruit master of management's alumni in central java?*. Retrieved last December 2012 from <http://puslit2.petra.ac.id/ejournal/index.php/mar/article/view/1836>
- Sprio, J., et. al. (1991). *Cognitive flexibility, constructivism and hypertext: Random access instruction for advanced knowledge acquisition in ill structured domains*. Retrieved November 2012 from www.wikipedia.org

- Spiro, R., et. al. (1990). Cognitive flexibility and hypertext: theory and technology for the non-linear and multi-dimensional traversal of complex subject matter. Retrieved July 15, 2012 from www.wikipedia.com
- Sprio, J., Et. al. (1991). *Cognitive flexibility, constructivism and hypertext: Random access instruction for advanced knowledge acquisition in ill structured domains*. Retrieved November 2012 from www.wikipedia/cognitiveflexibility/spiro
- Shelly, Gary, et. al. (2010). *Discovering computers complete*. Singapore, Cengage Learning Asia Pte. Ltd.
- Uy, Ivan (2011). *Computer World Journal. Celebrating National ICT*, Month July, Philippines, page 14.

A Flipped Learning Design with Peer Instruction to Engage (Esl) Students

Hani ALHASANI

Center for Instructional Technology and Multimedia (CITM)

University of Science, Malaysia,

Penang, 11800

hanimalhasani@gmail.com

Fauzy Mohd WAN

Center for Instructional Technology and Multimedia (CITM)

University of Science, Malaysia,

Penang, 11800

fauzy@usm.my

Mona MASOOD

Center for Instructional Technology and Multimedia (CITM)

University of Science, Malaysia,

Penang, 11800

msmona@usm.my

ABSTRACT

This study examines the effects of flipped learning on enhancing ESL students' engagement and reading comprehension skills. Digital materials such as PowerPoint slides and other online materials was utilized in addition with classroom instructions and discussed among peers with the goal of improving the teaching and learning process. A total of 170 samples with each group consisting of 85, both groups underwent a five-week period intervention to examine the effects of flipped learning (FLO) and flipped learning with peer instruction (FLPI), the moderating variable, was gender. Results from the ANOVA analysis showed that students who underwent the FLPI mode outperformed students who underwent the FLO for adjusted mean difference of 4.052 similarly students from the FLPI had a higher engagement score when compared to students from the FLO mode. However, there was no significant interaction effect between the FLPI, FLO and students engagement with regards to gender though, female students had a higher adjusted mean score in average for engagement compared to male students for both FLO and FLPI groups. The study finds that peer instruction is able to promote students' engagement; therefore activities involving peer instruction activities in the classrooms is recommended. In conclusion, the study finds that flipped learning with peer instruction for the Malaysian learners is able to enhance students' engagement in an introductory English course. The findings of this research thus have implications for the academic community at, online designers, instructors and students.

Keywords: flipped learning; engagement; peer instruction; gender; ESL

INTRODUCTION

Within a university system, students obtain instructional input through a lecture, then discuss or implement this information to activities and problems in subsequent sessions. Students can be equipped with high quality of deep learning because of the prominent role of improving an educational environment (Meyer, 2014). Flipped Learning (FL) or inverted classroom can be defined as a class where the homework and the lecture have been reversed; alternatively, the lecture that have traditionally taken place inside the classroom and moves to take place outside the classroom and vice versa so that students are enable to engage deeply (Alhasani, 2015; Giannakos et al., 2016; Kim et al., 2014; Szparagowski, 2014). Activities such as discussions, independent problem solving, student created contents, inquiry based learning and project based learning are constituents of active learning (Bergmann, Overmyer, & Wilie, 2012).

An online technique, in the flipped classroom, was used to deliver the lecture content outside the classroom such as through the Learning Management System (LMS). Likewise, Dutton (2015) and Lindquist and Long (2011) highlighted that participant often rely on ordinary tools, like the LMSs due to its familiarity and time saving reasons; hence, technology can be effectually enable instructive objectives as well as student engagement in university-level humanities education.

The constructivist learning view is related with the Vygotsky theories suggesting that learners' cognitive development is undoubtedly dependent on his/her social interactions and peer collaboration. The personal experiences frequency increases in flipped classroom environment using certain activities such as forming groups of active learners, learning by analysis engagement, evaluation and synthesis engagement, more than passive learners who learn by collecting information from videos watching and listening (Flumerfelt & Green, 2013; Jensen, Kummer, & Godoy, 2015).

Zepke (2013) pointed out that engagement is dependent on the effort that students put to actively participate in learning tasks, moreover, institutions are responsible to create environment that provide learning opportunities and make learning possible. The challenge is to get engagement from all types of students (Brown, et al., 2014). In the context of Malaysia, positive results were found means that only 3.6 percent of ESL undergraduates are categorized as "passive participants" who were present without engagement in the class during lecture. The other ESL undergraduates were actively participating in the discussion with teachers and classmates (Teoh, et al., 2013). Furthermore, reading engagement refers to interaction with text in a motivated and strategic manner (Guthrie & Wigfield, 2004).

Peer instruction (PI) focused on a student-centred approach in a way of reflecting the flipping classroom function (Mazur, 1997) All indicators show better results with the flipped teaching approach associated with Peer Instruction (Dutton, 2015; Porter, Bailey Lee, & Simon, 2013; Herreid & Schiller, 2013). In spite of the large size of class, Brookfield (2015) confirmed that students get engaged and discussing together the subject matter by using Peer Instruction.

Design of the Article (Relate, Create and Donate)

The basis of engagement theory is that the students must be engaged meaningfully in learning activities through useful tasks with the help of collaborative teams that work on certain designed projects that should be of practical nature and must be meaningful outside the classroom (DuFour & DuFour, 2013). Engagement theory is used as an approach to describe situations where students are engaged in learning activities meaningfully through group interactions and useful tasks. It seeks to create real-world problem situations that students may work on in groups. Students work in groups on assignments that are project based; thus, finding solutions to the real-world problems and individual exploration through online components, and they want to keep learning as they are motivated to learn (Mazur, 1997; Jones et al., 2013). Hence, any project is permanently designed around the three key elements of engagement theory which are "Relate-Create- Donate" (Kearsley & Shneiderman, 1999). Relating means learning activities occurred in a peer context or group (Peer Instruction), creating refers to the project based learning activities and donating refers to the learning activities that have an outside authentic concentration (meaningful task and authentic purpose). Figure 1 presents the suggested design for engagement theory coined with constructivist theory and flipped learning in which can create an interactive learning environment session in the future. Moreover, it will be exposed in certain projects for not only English courses but also in all subject matters.

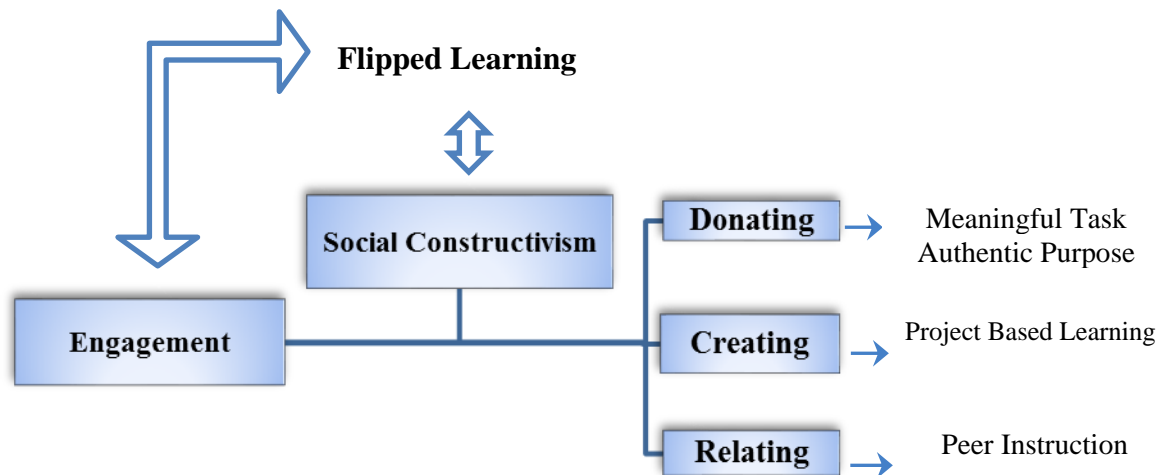


Figure.1. The design framework.

Gathering similar principles which include two different theories; Constructivist and Engagement, the paper showed the possibility of integrating them to achieve good level of engagement through the authentic focus on a problem. Educational technology can deliver access to the wide variety of materials, such as raw data and primary sources LMS, which students require to successfully accomplish authentic tasks (Lindquist & Long, 2011) (see Fig. 2). By focusing on Donating (authentic focus on a problem), as the final output of the project based learning, collaboration support and peer instruction (Wentzel, Battle, Russell, & Looney, 2010). Kearsley and Shneiderman (1999) concluded with relate to understand the variability and complexity of the engagement of student, and to recognize its value as a predictor of educational success. For example, Marshall (2007) claimed that teaching by using a combination of face-to- face lectures, online authentic material and workshops contributes to a significant feature of the course.

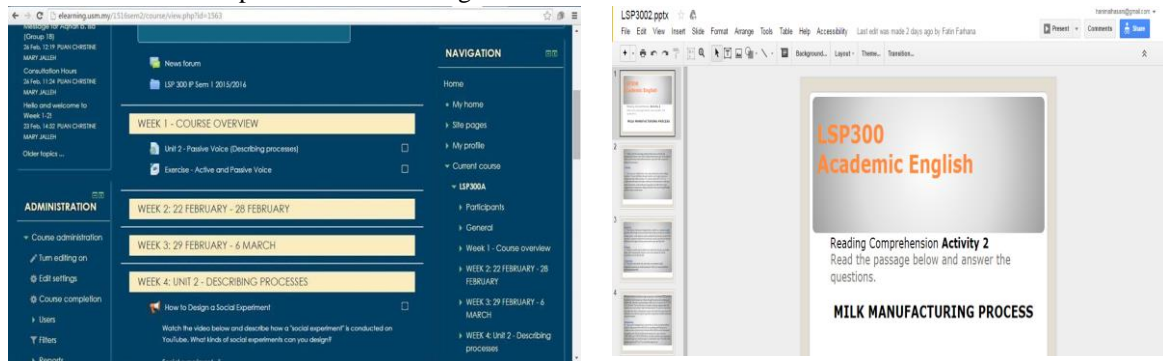


Figure. 2. Using LMS in delivering the contents

THE STUDY

The main objective of this paper is to suppose a design of the suitable theories of flipped learning with peer instruction that guide to discover the student engagement level. The entire framework of this present research builds upon the engagement theory by Kearsley and Shneiderman (1999) which serves as the framework for the technology-based teaching and learning Engagement; then, it integrates with the constructivist theory by Vygotsky (1978) to engage students actively. To address this gap, professors/instructors require to design and coordinate teaching activities that engage students and require cultivating interactive participation, focusing on concepts and insuring that the students understand the material (Tay & Allen, 2011). Scant research found in English language is unclear, therefore, the efficacy level of flipped classroom for English language teaching (ELT) setting remains blurred (Miller & Maloney, 2016). Thus we investigated:

1. The effects of Flipped Learning Only (FLO) and Flipped Learning with Peer Instruction (FLPI) on students' engagement in an Academic English course.
2. The effects of FLO and FLPI on students' engagement in an Academic English course with regards to their gender.

METHODS

An experimental study was conducted in a public Malaysian University for five weeks. An experimental study was conducted in a public Malaysian University for five weeks. One hundred and seventy Malaysian students were chosen from intact classes from various fields. Their age ranged from 20 to 22 years which represents 80 % of the total number of students who registered for the basic Academic English course. The students were divided into two groups equally, 85 for FLO and 85 for FLPI. Convenience sampling was used due to the definite type of students which fit the current study, easy accessibility, geographical proximity, availability at a given time, or the willingness to participate (Etikan, Musa, Alkassim, 2016).

INSTRUMENT

The engagement questionnaire (EQ) for this research was adopted from Reeve (2013). Moreover, the questionnaire has 21 items divided into four dimensions: Behavioural, Agentic, Cognitive, and Emotional. The engagement questionnaire is conceptualized as behavioural engagement with five items which describe the participation on class work and contribution to learning; seven items for agentic engagement depicted the suggestion and opinion on learning and contribution to enhance learning; cognitive engagement with four items focused on motivation and effort in learning and desire to explore what had been learn; and emotional engagement contains five items which concentrated on affective reaction in the classroom and sense of problem responsiveness. The Cronbach alpha for average engagement is .81 which is acceptable $>.70$. Table 1 shows the Cronbach alpha for the dimensions. The students were instructed to determine their engagement level following a 5-point Likert-Scale of 1-5 (5= strongly agree, 4=agree, 3=not sure, 2=disagree and 1=strongly disagree).

Table 1. *Cronbach Alpha of Engagement Questionnaire*

Aspect	Items	Alpha Value
Behavioural	5	0.81
Agentic	7	0.78
Cognitive	4	0.81
Emotional	5	0.80
Average Engagement	21	.81

FINDINGS

The descriptive statistics of average students' engagement is presented in Table 2 and Figure 3. It is shown that the mean, median and mode are 3.86, 3.82 and 3.57, respectively. Moreover, the minimum, maximum and standard deviation are 2.62, 4.95 and 0.46, respectively. From the responses to the 21 items, a student could score a maximum of 120 or a minimum of 21.

Table 2 Descriptive Statistics Students' Engagement

	N	Mean	Median	Mode	Standard Dev.	Minimum	Maximum
Behavioural Engagement	170	4.039	4.000	4.000	.570	2.20	5.00
Agentic Engagement	170	3.861	3.857	3.57	.529	2.14	5.00
Cognitive Engagement	170	3.720	3.625	3.50	.755	1.25	5.00
Emotional Engagement	170	3.773	3.800	3.800	.730	1.80	5.00
Average Engagement	170	3.856	3.821	3.57	0.455	2.81	4.95

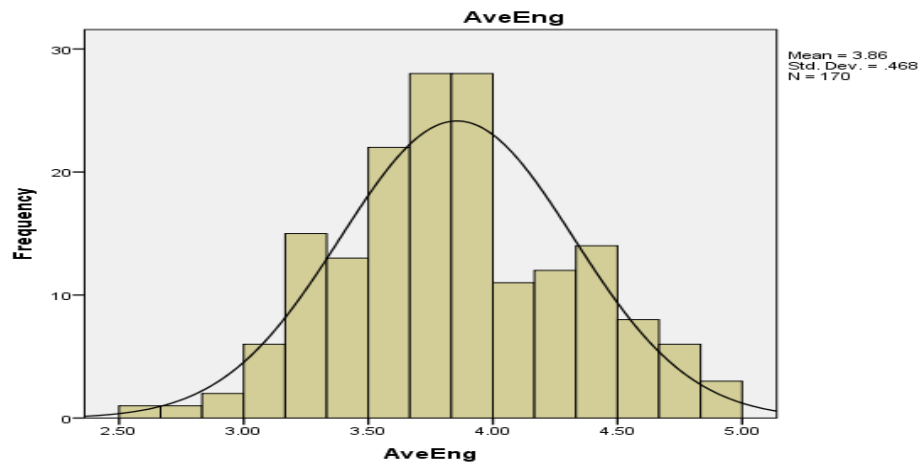


Figure 1.3 Frequency distribution of Average students Engagement

Description of Students' Engagement Scores Based on Groups

The study makes comparison between FLO and FLPI groups based on the adjusted mean scores of students' engagement. Table 3 indicates that there are differences between the adjusted mean scores of average students' engagement in FLO and FLPI groups. It is shown that the adjusted mean scores of FLPI (4.052) with standard error (0.046) is larger than the adjusted mean of FLO (3.671) with standard error (0.046).

Table 3. Description of Students' Engagement Scores Based on Groups

Dependent Variable	Groups	N	Mean	Std Dev.	Adjusted Mean	Std Error
AveEng	FLO	85	3.667	.389	3.671 ^a	.048
	FLPI	85	4.041	.442	4.052 ^a	.046

Table 4 shows the Z-values for both skewness and kurtosis as well as the statistics utilized for their computation. The Z-values were computed using the formula proposed by Tabachnick and Fidell (2007). Since it is shown that the computed Z-values for both skewness and kurtosis are lower than the critical value of Z-distribution at .01 level, the assumption about normality failed to be rejected. Hence, the distribution has no skewness and kurtosis problems. It is shown that the distribution of student's engagement are negatively skewed. Similarly, both the distribution of student's engagement have negative kurtosis. In the following part, Figure 1.4 shows normal Q-Q Plot of average students' engagement.

Table 4. *Z-Value for Student's Engagement*

	Average Engagement
N	170
Minimum	2.81
Maximum	4.95
Mean	3.854
Std Error of Mean	.035
Median	3.809
Mode	3.57
Std Deviation	.455
Skewness	.276
Std error of Skewness	.186
Z-value for Skewness	1.484
Kurtosis	-.413
Std Error of Kurtosis	.370
Z-value Kurtosis	-1.116

Description of Students' Engagement Scores Based on Groups

Table 5 indicates that there are differences between the adjusted mean scores of average students' engagement in FLO and FLPI groups. It is shown that the adjusted mean scores of FLPI (4.052) with standard error (0.046) is larger than the adjusted mean of FLO (3.671) with standard error (0.046).

Table 5. *Description of Students' Engagement Scores Based on Groups*

Dependent Variable	Groups	N	Mean	Std Dev.	Adjusted Mean	Std Error
AveEng	FLO	85	3.667	.389	3.671 ^a	.048
	FLPI	85	4.041	.442	4.052 ^a	.046
BehEng	FLO	85	3.878	.583	3.914 ^a	.064
	FLPI	85	4.200	.512	4.201 ^a	.061
AgeEng	FLO	85	3.713	.555	3.718 ^a	.059
	FLPI	85	4.009	.459	4.007 ^a	.057
CogEng	FLO	85	3.473	.756	3.464 ^a	.082
	FLPI	85	3.968	.671	4.022 ^a	.078
EmoEng	FLO	85	3.562	.738	3.576 ^a	.082
	FLPI	85	3.984	.662	3.993 ^a	.078

Description of Students' Engagement Scores Based on Groups and Gender

Table 6 reports the adjusted mean scores of both male and female students in FLO and FLPI groups. It reveals that there is a difference between the adjusted mean scores of male and female in average engagement in FLO and FLPI groups. The adjusted means of male and female students in both FLO and FLPI indicate that the adjusted mean score of female students in FLPI (4.059) with standard error (0.058) is higher than the adjusted mean score of male students in FLPI (4.046) with standard error (0.072). Similarly, the adjusted mean score of female in FLO (3.687) with standard error (0.056) is higher than the adjusted mean score of male in FLO (3.655) with standard error (0.078).

Table 6. *Description of Students' Engagement Scores Based on Groups and Gender*

Dependent Variable	Groups	Gender	N	Mean	Std Dev.	Adjusted Mean	Std Error
AveEng	FLO	Male	30	3.635	.388	3.655 ^a	.078
		Female	55	3.685	.392	3.687 ^a	.056
		Total	85	3.667	.389		
	FLPI	Male	33	4.039	.459	4.046 ^a	.072
		Female	52	4.041	.434	4.059 ^a	.058
		Total	85	4.040	.442		

Results of Students' Engagement Scores Based on Groups and Gender

The results presented in Table 7 show that the interaction effect on average students' engagement is not statistically significant at the 0.05 level $F(1, 161) = 0.022, p=0.882$. Thus, it cannot be concluded that female students in FLPI have more average students' engagement relative to male students in FLPI. Also, it cannot be inferred that male and females students in FLPI have greater average students' engagement compared to male and females students in FLO. But, we cannot reject the hypothesis that there is no interaction effect between groups and gender in students' engagement at 0.05 statistically significant level. The results reveal that the effect of the FLO and FLPI on average students' engagement is statistically significant at the 0.05 level $F(1, 161) = 32.976, p=0.000$. Since the adjusted mean of FLPI (3.996) is larger than the adjusted mean of FLO (3.710), it could be concluded that FLPI is more effective relative to FLO. Hence, we reject the hypothesis that 'there is no significant difference in students' engagement when using FLO and FLPI'. The effect size is large ($\omega^2 = 0.153$) based on the criteria set by Kinnera and Gray (2008). Accordingly, the size effect is small with $\omega^2 < 0.06$, medium with $0.06 \leq \omega^2 < 0.14$ and large with $\omega^2 > 0.14$. Finally, the statistical results support the hypothesis that students who treated with FLPI were more engaged compared to students who treated with FLO.

Table 7. Results of Average Students Engagement scores based on Groups, Gender

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power ^b
Corrected Model	AveEng	7.861a	8	.983	5.825	.000	.244	1.000
Intercept	AveEng	63.615	1	63.615	3771.130	.000	.701	1.000
Group	AveEng	5.562	1	5.562	32.976	.000	.170	1.000
Gender	AveEng	.020	1	.020	.118	.732	.001	.063
Group*Gender	AveEng	.004	1	.004	.022	.882	.000	.052
Error	AveEng	27.157	161	.169				
Total	AveEng	2559.935	170					
Corrected Total	AveEng	35.018	169					

a. R Squared = .224 (Adjusted R Squared = .186) b = Computed using alpha = .05

DISCUSSION

The adjusted mean score of the average students' engagement in the FLPI was significantly higher than the adjusted mean scores of students' engagement in the FLO group. The statistical results support the hypothesis that students who treated with FLPI have more average engagement than students who were administered with the FLO.

The results of the ANOVA was not statistically significant at 0.05 level $F(1, 161) = .008$, $p = .929$. The results of the ANOVA reveal that none of the dimensions of engagement was statistically significant at 0.05 level. Although it could be argued that female students have more engagement (considering adjusted mean scores of average engagement) compared to male students, but the effects are not statistically significant at 0.05 level.

The results presented in Table 7 show that the interaction effect on average students' engagement is not statistically significant at the 0.05 level $F(1, 161) = .022$, $p = .882$. Thus, it cannot be concluded that female students in the FLPI have more average students' engagement relative to male students in FLPI. Also, it cannot be inferred that male and females students in FLPI have greater average students' engagement compared to male and females students in the FLO. But, we fail to reject the hypothesis that there is no interaction effect between groups and gender in students' engagement at 0.05 statistically significant level.

Female students have a higher adjusted mean score in the average engagement than male students regardless of group. However, the statistical results did not support the hypothesis that students' engagement was more effective with regards to gender. As for the dimensions of engagement, the study finds mixed results for gender. While the adjusted mean scores of female students are greater than the adjusted mean scores of male students in agentic engagement, the reverse is the case in behavioural, cognitive and emotional engagements. This finding refutes Teoh et al. (2013) who compared students' engagement and its indices across gender and year of study. They found that female students showed greater engagement than male students, albeit there was no significant difference on year of study.

This study suggests that the difference between the adjusted mean scores of male and female students in engagement is statistically insignificant. Several reasons could be responsible for this phenomenon. First, it implies that there was no difference in the level of interaction between the students (male and female) and the instructor. Similarly, the students irrespective of gender also interacted with the content of the course. Unlike some countries (Saudi Arabia) where male and female students are physically segregated in the learning environment (and respectively taught by the same gender, which could have effect on their learning outcomes (Albalawi, 2007), this study finds that both male and females students have same level of interactions.

Second, the attitudes of the students towards the lessons could be responsible for the results. Both male and female students have the same attitudes towards their tasks during the lessons. This refutes the assertion that male students have more positive attitudes than female students in the use of computer technology assisted learning or when working with the internet because the latter is a male-dominated technology (Gunn et al., 2003). The outcomes of this study confirm some recent studies (Ono & Zavodny, 2003) that indicated no significant difference in the use of technology and computer among male and female students.

Furthermore, there was no significant difference in the level of participation in the learning environment between female and male students. The guidance and direction received by male and female students were also identical. The discussion among the groups and with the teacher gives valuable direction to the students to follow and this improved the participation of male and females students thereby having identical engagement level. As noted by Dixon (2010) for task completion individually and in groups, the instructor acts as catalyst for the students in order for them to have greater engagement with the presence of the instructor. This has positive effects on their engagement and learning experiences.

Also, the male and female students in this research were given the same module, same learning activities and were exposed to the same e-learning processes (pre-test, presentation/discussion and post-test feedback). The male and female students were given the same orientation regarding the objectives of the study, and they attained identical level of engagement. Wen (2008) computed the way student engagement in same task could well be oriented to the objective of learning language because the students finds it fundamentally fascinating which have positive impact on learning outcomes. Sierra and Wang (2002) found no significant gender differences in online discussions.

IMPLICATIONS AND RECOMMENDATIONS

Either learners or faculty members will have a greater knowledge in using the flipped classroom approach as it has later empowered students to take into their consideration of their learning tasks and to be engaged in peer instructions. For practical purposes, this project will be limited to an investigation of on-campus small-class size delivery, hence, monitoring of students individually enable the project to be acknowledged achievement. Agreeing with the claim of Szparagowski (2014) that the flipped classroom lessons with a small time table, the instructor might focus the use of developing student background knowledge more effectively. Further work is needed to establish the real connection between the theories of student engagement, student learning and their implementation through applicable teaching methods. These hints will be emerged via continuous teaching, research, and publication. Ultimately, this study urges for a new understanding of how the FLO can be useful for engagement, but not as effective as the FLPI, when it compared to the same results of engagement. The study recommends repeating these flipped lessons with peer instruction again due to additional practice problems can be added via videos to give students more practice than just the video quiz.

CONCLUSION

The aim of this paper is to provide a structured framework for class activities that is fixed in good educational practice and theory, and to address the student engagement interaction inside the class that are identified in the literature of university engagement. This research explicitly highlighted the major implications of the findings from the study. It stressed the importance of PI as a complement to FL.

The finding of this research could increase the opportunities for collaboration between researchers and the academic community at the national, regional and international levels. This research could accentuate the establishment of a theoretical framework on FL with PI on how to promote students' engagement and reading comprehension. It also makes useful contribution to the study on PI. The findings of this research would be beneficial to course designers and instructors in designing learning environments that would give consideration to students experience instruction, construct and knowledge process in such a way that the course design focus on meaningful learning in-line with the curriculum.

ACKNOWLEDGEMENTS

The work described in this paper was part of the research for a PhD study. Funding for Research grant was provided by University of Science, Malaysia (USM) to Centre For Instructional Technology and Multimedia (CITM) with no: (1001/PMEDIA/816287).

REFERENCES

- Albalawi, M. S. (2007). Critical factors related to the implementation of web-based instruction by higher education faculty at three universities in the Kingdom of Saudi Arabia. Unpublished dissertation of Doctor of Education. The University of West Florida.
- Alhasani, HMA. (2015). Design and precept of a flipped classroom style and its impact on traditional education. 2nd World Symposium on Web Applications and Networking (WSWAN), Sousse, 2015, pp. 1-4. doi:10.1109/WSWAN.2015.7210350
- Bergmann, J., Overmyer, J., & Wilie, J. (2012). The Flipped Classroom: Myths vs Reality. The Daily Riff: Be Smarter About Education.
- Brookfield, S. D. (2015). The skillful teacher: On technique, trust, and responsiveness in the classroom: John Wiley & Sons.
- Brown, A., Rich, M., & Holtham, C. (2014). Student engagement and learning: Case study of a new module for business undergraduates at Cass business school. *Journal of Management Development*, 33(6), pp.603-619, <https://doi.org/10.1108/JMD042014-0038>
- Dixson, D.M. (2010). Creating effective student engagement in online courses: What do students find engaging? *Journal of the Scholarship of Teaching and Learning*, 10(2), pp. 1 – 13.
- DuFour, R., & DuFour, R. (2013). *Learning by Doing: A Handbook for Professional Learning Communities at Work TM*: Solution Tree Press.
- Dutton, S. E. (2015). *Education In Rhythm and By Rhythm: Exploring Holistic Experiences in Dalcroze Pedagogy*. University of Toronto.
- Etikan I, Musa SA, Alkassim RS (2016) Comparison of convenience sampling and purposive sampling. *American Journal of theoretical and applied statistics* 1-4.
- Flumerfelt, S., & Green, G. (2013). Using Lean in the Flipped Classroom for At Risk Students. *Educational Technology & Society*, 16(1), 356-366.
- Giannakos, M. N., Krogstie, J., & Aalberg, T. (2016). Toward a Learning Ecosystem to Support Flipped Classroom: A Conceptual Framework and Early Results State-of-the-Art and Future Directions of Smart Learning (pp. 105-114): Springer.
- Gunn, C., McSporran, M., Macleod, H., & French, S. (2003). Dominant or different? Gender issues in computer supported learning. *Journal of Asynchronous Learning Networks*, 7, 14-30.
- Guthrie, J. T. (2004). Classroom contexts for engaged reading: An overview. In J. T. Guthrie, A. Wigfield & K. C. Perencevich (Eds.), *Motivating reading comprehension: Concept-Oriented Reading Instruction* (pp. 1-24). Mahwah, NJ: Erlbaum.
- Herreid, C. F., & Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching*, 42(5), 62-66.
- Jensen, J. L., Kummer, T. A., & Godoy, P. D. d. M. (2015). Improvements from a flipped classroom may simply be the fruits of active learning. *CBE-Life Sciences Education*, 14(1), ar5.
- Jones, B. D., Epler, C. M., Mokri, P., Bryant, L. H., & Parette, M. C. (2013). The effects of a collaborative problem-based learning experience on students' motivation in engineering capstone courses. *Interdisciplinary Journal of Problem-based Learning*, 7(2), 2.

- Kearsley, G., & Shneiderman, B. (1999). Engagement theory: A framework for technology-based teaching and learning. Retrieved July 2002.
- Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: an exploration of design principles. *The Internet and Higher Education*, 22, 37-50.
- Kinnera, P.R., & Gray, C.D. (2008). *SPSS 16 Made Simple*. New York: Psychology Press.
- Lindquist, T., & Long, H. (2011). How can educational technology facilitate student engagement with online primary sources? A user needs assessment. *Library Hi Tech*, 29(2), 224-241.
- Marshall, S. (2007). Engagement Theory, WebCT, and academic writing in Australia. *International Journal of Education and Development using ICT*, 3(2).
- Mazur, E. (1997). *Peer instruction*: Upper Saddle River, NJ: Prentice Hall.
- Meyer, K. A. (2014). *Quality in Distance Education: Focus on On-Line Learning*. ASHE-ERIC Higher Education Report. Jossey-Bass Higher and Adult Education Series.
- Miller, Z. F., & Maloney, J. (2016). REVIEW OF LANGUAGE LEARNING WITH DIGITAL VIDEO. *About Language Learning & Technology*, 46.
- Ono, H., & Zavodny, M. (2003). Gender and the Internet. *Social Science Quarterly*, 84 (1), 111-121.
- Peregoy, S.F. & Boyle, O.F. (2008). *Reading, writing, and learning in E.S.O.L.: A Resource book for teaching k-12 English Learners*. 5th Ed. Boston: Pearson Education, Inc.
- Porter, L., Bailey Lee, C., & Simon, B. (2013). Halving fail rates using peer instruction: a study of four computer science courses. Paper presented at the Proceeding of the 44th ACM technical symposium on Computer science education.
- Reeve, J. (2013). How students create motivationally supportive learning environments for themselves: The concept of agentic engagement. *Journal of Educational Psychology*, 105, 579–595. doi:10.1037/a0032690
- Sierra, C., & Wang, M. (2002). Gender, discourse style, and equal participation in online learning. In G. Richards (Ed.), *Proceedings of E-Learn 2002 Conference* (pp. 2364-2367), Chesapeake, VA: AACE
- Szparagowski, R. (2014). *The Effectiveness of the Flipped Classroom*. Honors Projects. Paper 127.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn & Bacon.
- Tay, E., & Allen, M. (2011). Designing social media into university learning: technology of collaboration or collaboration for technology? *Educational Media International*, 48(3), 151-163.
- Teoh, H. C., Abdullah, M. C., Roslan, S., & Daud, S. (2013). An Investigation of Student Engagement in a Malaysian Public University. *Procedia-Social and Behavioral Sciences*, 90, 142-151.
- Vygotsky, L. (1978). Interaction between learning and development. *Readings on the development of children*, 23(3), 34-41.
- Wen, Q. (2008). On the output-driven hypothesis and reform of English-skill courses for English majors. *Foreign Language World*, 2, 2–9.
- Wentzel, K. R., Battle, A., Russell, S. L., & Looney, L. B. (2010). Social supports from teachers and peers as predictors of academic and social motivation. *Contemporary Educational Psychology*, 35(3), 193-202.
- Zepke, N. (2013). Student engagement: A complex business supporting the first year experience in tertiary education. *The International Journal of the First Year in Higher Education*, 4(2), 1.

Academic and Social Media Practices of Arabic Language Among Malaysian Students

Wail ISMAIL

Faculty of education, University of Malaya

Muhammad Azhar ZAILANI

Faculty of education, University of Malaya

Zakaria Alcheikh Mahmoud AWAD

Centre for Sustainable Urban Planning and Real Estate (SUPRE),

Faculty of Built Environment,

University of Malaya.

Zaharah HUSSIN

Faculty of education, University of Malaya

Mohd FAISAL

Faculty of education, University of Malaya

Rahimi SAAD

Faculty of education, University of Malaya

ABSTRACT

Nowadays, more and more countries are paying attention to graduates' language skill and sending their students abroad to learn languages. As an Islamic country, Malaysia has sent many students to learn Arabic language and Islamic knowledge. This paper aims at examining the level of practice of Arabic language among Malaysian students in Jordanian universities. The study seeks to answer the following questions: What is the level of practice of Arabic language (academic, social media) among Malaysian students of Jordanian universities? Do any significant differences exist in the level of Arabic language practiced by Malaysian students of Jordanian universities in relation to certain variables? Results indicate that the Malaysian students had a medium level of practice of Arabic language. Significant differences were observed among gender, marital status, and field of study variables, whereas no significant difference was identified among university, level of study, distance of residence to the university, previous school, housemate qualities, nor CGPA.

INTRODUCTION

Many nations have acknowledged the need to produce more graduates who are multilingual in the effort to compete in the global society. Malaysia has confirmed the importance of proficiency in a third language in order to develop human capital that helps the economy besides remaining competitive in the international arena (Zubairi & Sarudin, 2009 ; Pufahl, Rhodes & Christian, 2000). As an Islamic country, Malaysia is one of the countries paying most attention to the study and preservation of Arabic language, and it provides scholarships to support a large number of students to study abroad in different fields related to the study of Arabic (Latifah binti Abdul Latiff, 2004).

According to Oberg (2006) students studying abroad undergo four stages in their adjustment and practice of the target language. In the first few weeks, most of the students were observed to have a fascination with the new environment and language. This stage may last from a few days or weeks to six months depending on circumstances. The second stage is characterized by a hostile and aggressive attitude toward the host country, resulting in troubles at home and school, in language study, transportation, and shopping, whereas the people in the host country are largely indifferent to all these troubles. The consequence is aggression and the tendency of the students to join their fellow countrymen in criticizing the host country. People who overcome the second stage stay in the host country; otherwise, they leave before reaching the stage of a nervous breakdown. If the students succeed in obtaining knowledge of the language, which is a basic requirement in learning, and begin to use the language, their learning will be facilitated. In acquiring a complete adjustment at the fourth stage, one not only adapts to the food, drinks, habits, and language, but also begins to enjoy them. Students who are in the process of practice and understanding will attain enjoyment in time.

The language acquisition process does not involve a conscious or organized effort, but it is a tradition and simulation dependent on social learning theory. According to Bandura, a basic role of social learning theory is an individual obtaining opportunities in various life situations and spontaneously as required in social communication. For example, the children acquire language by exposure to many opportunities involving the practice of the language with the community and learning the origins of the language and its rules (Abdulsalam, 2012; Lightbown & Spada, 2002).

So, the high interaction within a group will result in an individual learning the target language more rapidly than an individual performing self-learning because of the continued use and practice of the language. Alternatively, a student who does not engage in interaction will fall behind because of inadequate practice and use of the language (David, 1997).

De Keyser (2007) indicated that practice has a central importance in skill acquisition in both cognitive and educational psychology. In cognitive psychology, Anderson (2000) mentioned the adaptive control of thought theory that hypothesizes practice as the driving force behind skill acquisition and the vehicle that can transform declarative knowledge to procedural and then to automatized knowledge. In educational psychology, Ericsson,

Krampe, and Tesch-Romer (1993), Ericsson and Charness (1994), and Ericsson (1996) demonstrated the effect of deliberate practice in developing expert skills in a wide range of domains. In addition, numerous hours of specific practice and training are necessary in reaching the highest levels of performance (Ericsson, 2006). Contrary to common belief, the effects of extended deliberate practice are highly extensive. Performers can acquire skills that circumvent the basic limitations on working memory capacity and sequential processing. Deliberate practice also induces anatomical changes as a result of adaptation to intense physical activity. The study of expert performance has important implications for our understanding of the structure and limits of human adaptation and optimal learning. The scientific study of deliberate practice will enhance our knowledge about how experts optimize the increase in performance and motivation through a high level of daily practice continued for days, months, and years (Ericsson, 2004).

De Keyser (1998) viewed the relevance of practice in second language learning as an essential skill to be acquired, and the engagement in deliberate practice predicted higher performance ratings (Sonnetag and Kleinc, 2000). Ushida (2005) identified students who are most successful in learning a second language as those who consistently speak the language and integrate with the culture connected with the language. This is strongly associated with the personality of the individual (Smith and Renk, 2007).

On the other hand, we are currently surrounded by new technology, such as computers, the Internet, e-mail, voice mail, compact discs, and fax machines, which create meaningful and relevant contexts for learning language. According to modern language principles and practice, the use of ICT can bring people directly into contact/practice with others from around the world, and provide real-life contexts that motivate students and young people and help them to see a purpose to their language learning and help them to develop their knowledge, understanding and appreciation of the culture surrounding the language being studied (Education Scotland, 2015).

In this study, we discuss about social media, Grahl (2013) revealed that social media can be divided into six different which include: 1.social networks (e.g., Facebook, LinkedIn); 2.bookmarking sites (e.g., Delicious, StumbleUpon); 3.social news (e.g., Digg, Reddit); 4.media sharing (e.g., Instagram, YouTube, Flickr); 5.microblogging (e.g., Twitter); and 6.blogging, particularly comments and forums. The popularity of social media tools has increased dramatically over the past years.

Hillman and Säljö (2016) advocated that academic learning was not only limited in the school, the use of social media is also one important resource. Hence, the practice of Arabic language learners does not only depend on the academic aspect, that is, the atmosphere of learning and teaching in the field of education, but also on the direction and extent of practice in various areas, such as random exposure, involvement in the social community, culture and customs, participation in different clubs and activities, and use of media or television (Ahmed, 2011).

Moreover, Mikal and Grace (2012) commented that social media and electronic connections to family members can reduce stress and help students with psychological adjustment in living abroad. Emotionally well-adjusted students find it easier to enjoy their experience in a foreign culture and to be more satisfied when engaging with locals (Mikal, Yang, & Lewis, 2014).

Álvarez Valencia (2015) declared that “social networking has compelled the area of computer-assisted language learning (CALL) to expand its research palette and account for new virtual ecologies that afford language learning and socialization”.

New technical possibilities result in new types of text and then to new social possibilities, as people find different means of communicating and practicing a language with each other (Shortis, 2001). Gray et al. (2007) revealed that students overall have a positive perception on the use of Internet tools in language study. A computer-mediated communication environment was revealed to decrease the psychological barriers of students, enabling them to freely express their opinions and to actively communicate on the Internet, while their critical thinking, problem-solving, and communication skills are enhanced by online activities or class homepage construction. The criterion of success is whether students have a strong and authentic sense of development and evolution in their language practice, their understanding of their language practice, and the situations in which they practice (Atweh et al., 2002).

Godwin-Jones (2016) discussed in his study the personal and learning benefits of technology use while abroad, the formation of second-language identities, the affordances for pragmatic language development, the integration of mobile devices for place-based language learning, and the opportunities for enhancing intercultural communication competence; all of this explained that social media help students in language learning while abroad.

Only a few studies have discussed the impact factors on language learning abroad, for example: gender (Kinging, 2013; Pellegrino Aveni, 2005), age, racial or ethnic characteristics (Simon & Ainsworth, 2012) and Social class and economic status also can be factors as well (Kinging, 2004). A major contributor to success or failure is motivation, or the degree to which students are invested in becoming part of the target linguistic and cultural community (Godwin-Jones, 2016).

Hence the purpose of this study is to investigate the level of practice of Arabic language (academic, social media) among Malaysian students in Jordanian universities. And to see if any significant differences exist in the level of Arabic language practice of Malaysian students in Jordanian universities in relation to gender, university, field of study, level of study, marital status, distance of residence to the university, previous school, housemate qualities, and CGPA.

METHODS

Participants and Sampling

The participants of this study comprised Malaysian students who are studying in Jordanian universities. After researchers refer to some of the studies (Harmer, 1991; Raban, Brown, Care, Rickards & O'Connell, 2011). The language practice questionnaire covered 35 items and the researchers distributed them to a random sample of 386 students from the following institutions see [Table 1]

Table 1. Frequency and percent scores on variables

Study Variables	variables levels	Frequency	Percent
Gender	Male	170	44.0
	Female	216	56.0
University	University of Jordan	15	3.9
	University of Yarmouk	160	41.5
	University of Mu'tah	53	13.7
	Jordan University of Science and Technology	37	9.6
	Al Bait University	121	31.3
Field of Study	Study of Islam (Shariah/Usuluddin/Islamic Economics...)	260	67.4
	B.A. (Language/Literature Arabic...)	87	22.5
	Science (Medical/Dental/Pharmacy...)	39	10.1
Level Of Study	Year 1	189	49.0
	Year 2	86	22.3
	Year 3	68	17.6
	Year 4	43	11.1
Marital Status	Single	371	96.1
	Married	15	3.9
Distance of residence to the university	About 500 meters	223	57.8
	Around 1000 meters	60	15.5
	More than 1000 meters	103	26.7
Previous School	National Religious Secondary School	92	23.8
	Religious Government Aided School	149	38.6
	People of Religious school	65	16.8
	National Secondary/Boarding School	80	20.7
Housemates	From one country (Malaysia) only	106	27.5
	the various states (Malaysia)	263	68.1
	A variety of countries, including Jordan	17	4.4
C. Percentage G.P.A.	84 to	20	5.2
	68-75	177	45.9
	76-83	162	42.0
	68 and below	27	7.0
Total		386	100.0

Table 1 shows the details of the participants. From this table we can see that the number of female students (216) exceeds the male students (170); University of Jordanian (10 males and 5 females), Yarmouk (72 males and 88 females), Mu'tah (12 males and 41 females), Science and Technology (22 males and 15 females), and Al Bait (12 males and 41 females). Some 96.1% of participants are single and 67.4% participants study in field of Islam.

Furthermore, around 80% participants' previous schools are religious schools and around 96% participants' housemates are Malaysian.

Reliability of the Instrument

According to Pallant (2007), reliability refers to internal consistency, which denotes the extent of cohesion among the items of the instrument; that is, how the items measure the same underlying construct (language practice). The results are shown in [Table 2]

Table 2. Coefficient reliability of the language practice scale

	Cronbach's alpha	N of Items
	.94	36

Among various statistical references, the main test used to check the reliability or the internal consistency of the instrument was the Cronbach's alpha coefficient, which should have a value of more than .7 (Pallant, 2007). With the Cronbach's alpha coefficient of .94 for the entire instrument (36 items) of the language practice scale, therefore the instrument is acceptable and has good internal consistency ($.94 > .7$).

FINDINGS

The study answers the following three questions:

1. What is the level of Arabic language practice (academic and social media) of Malaysian students in Jordanian universities?

To answer this question, the researcher analyzed the language practice score from SPSS. Means and standard deviations scores were used to clarify the level of Arabic language practice of Malaysian students in Jordanian universities.

Table 3. Means and standard deviations scores on the practice item

	N	Mean	Std. Deviation
Academic Practice	386	3.4624	.59768
Social media Practice	386	3.2205	.75220
Valid N (list wise)	386		

Table 3 shows that students have a medium level of academic practice ($M=3.46$, $SD=0.59$), and social media practice ($M = 3.22$, $SD = 0.75$) for Arabic language. And the participants practice using social media less than academic practice.

2. Do any significant differences exist in the level of Arabic language practice of Malaysian students in Jordanian universities in relation to gender, university, field of study, level of study, marital status, distance of residence to the university, previous school, housemate qualities, and C. percentage G.P.A.?

The following Table 4 gives the mean and standard deviation scores on the practice language according to variables of the study.

Table 4. Means and standard deviations scores on the practice language by variables of the study

Study Variables	Variables levels	Mean	Std. Dev.
Gender	Male	3.40	0.61
	Female	3.38	0.61
University	University of Jordan	3.19	0.45
	University of Yarmouk	3.34	0.62
	University of Mu'tah	3.45	0.59
	Jordan University of Science and Technology	3.01	0.59
	Al Bait University	3.56	0.56
Field of Study	Study of Islam (Shariah/Usuluddin/Islamic Economics...)	3.38	0.57
	B.A. (Language/Literature Arabic...)	3.62	0.61
	Science (Medical/Dental/Pharmacy...)	2.97	0.58
Level Of Study	Year 1	3.37	0.62
	Year 2	3.28	0.54
	Year 3	3.57	0.53
	Year 4	3.41	0.73
Marital Status	Single	3.37	0.60
	Married	3.92	0.55
Distance of residence to the university	About 500 meters	3.41	0.63
	Around 1000 meters	3.39	0.45
	More than 1000 meters	3.34	0.65
Previous School	BC National Religious	3.42	0.53
	Religious BC Government Assistance	3.41	0.62
	SM Agama Rakyat	3.45	0.64
	BC National/Residential	3.26	0.64
Housemates	From one country (Malaysia) only	3.29	0.55
	the various states (Malaysia)	3.39	0.62
	A variety of countries, including Jordan	3.95	0.47
C. Percentage G.P.A.	84 to	3.21	0.66
	68-75	3.37	0.63
	76-83	3.47	0.57
	68 and below	3.17	0.61

As shown in Table 4, significant differences were observed between the averages of second language practice among the respondents, considering the previously mentioned variables. To examine the significance of these statistical differences, nine-way ANOVA without interaction analysis was performed, and the results are presented in Table 5.

Table 5. 9-way ANOVA without Interaction on the practice Arabic language by variables of the study

Source	Sum of Squares	df	Mean Square	<i>F</i>	Sig.
Gender	2.561	1	2.561	8.297	0.004
University	2.448	4	0.612	1.982	0.097
Field of Study	3.631	2	1.816	5.882	0.003
Level of Study	2.484	3	0.828	2.682	0.047
Marital Status	3.013	1	3.013	9.761	0.002
Distance of Residence	0.375	2	0.188	0.608	0.545
Previous School	0.706	3	0.235	0.762	0.516
Housemates	4.746	2	2.373	7.687	0.001
C Average GPA	2.908	3	0.969	3.140	0.025
Error	112.366	364	0.309		
Total	142.396	385			

Table 5 shows the statistically significant differences among the following variables at the level of $\alpha \geq 0.05$ in the second language practice: there are no significant difference $\alpha \geq 0.05$ among universities, Distance of residences and Previous schools. Moreover, there are significant difference $\alpha < 0.05$ in male ($M = 3.40$, $SD = 0.61$) and female ($M = 3.38$, $SD = 0.61$) the results favored male respondents, Marital status married ($M = 3.92$, $SD = 0.55$) and not married ($M = 3.37$, $SD = 0.60$) the results favored respondents who were married.

To derive the statistically significant difference field of Study (Study of Islam or B.A. or Science), Level of Study (Year 1 or Year 2 or Year 3 or Year 4), Housemates (From one country (Malaysia) only or the various states (Malaysia) or A variety of countries, including Jordan), C Average GPA (84 to or 68-75 or 76-83 or 68 and below) the researcher conducted the Levene test to check the homogeneity of variances, power and robust to non-normality (Gastwirth & Miao, 2009), the results are shown in [Table 6].

Table 6. Levene test results of practice by variable (Field of Study, level Of Study Housemate, C. Average GPA)

<i>F</i>	df1	df2	Sig.
1.387	254	131	0.018

The results indicated a violation of the homogeneity of variance at the significance level of $\alpha = 0.05$ because of the variables of the study, which include field of study, level of study, housemate qualities, and CGPA. Hence ($\alpha < 0.05$). Thus, the researchers implemented the Games–Howell test to detect significant differences between the arithmetic mean which include field of study, level of study, housemate qualities, and CGPA. Hence. The Games-Howell is essentially a *t*-test for unequal variances that accounts for the heightened likelihood of finding statistically significant results by chance when running many pairwise tests (Howell, 2012). The results of this test are presented in Tables 7, 8, 9, and 10.

To detect significant differences between Field of Study (Study of Islam or B.A. or Science), the researcher used the Games –Howell test to analysis the language practice scores and the results are shown in Table 7.

Table 7: Games –Howell test the degree of practice by variable Field of Study

Field of Study		Science (Medical/Dental/ Pharmacy...)	Study of Islam (Shariah/ Usuluddin/ Islamic Economics...)
Games-Howell	Mean	2.965	3.376
Study of Islam (Shariah/Usuluddin/Islamic Economics...)	3.376	0.411	
B.A. (Language/Literature Arabic...)	3.618	0.653	0.242

The findings demonstrate a statistically significant difference at the level of $\alpha \geq 0.05$ for the arithmetic mean of field of study, which favored students of B.A. in Language/Literature Arabic ($M = 3.62$, $SD = 0.65$) compared with those specializing in Science (Medical/Dental/Pharmacy) ($M = 2.97$, $SD = 0.41$) and Shariah/Usuluddin/Islamic Economics ($M = 3.37$, $SD = 0.24$). By contrast, the differences were more favorable to students of Shariah/Usuluddin/Islamic Economics than to students of Science (Medical/Dental/Pharmacy) in Arabic language practice.

To detect significant differences between Level of Study (Year 1 or Year 2 or Year 3 or Year 4), the researcher used the Games-Howell test to analysis the language practice scores and the results are shown in [Table 8].

Table 8. Games –Howell test the degree of practice by variable level of Study

Level Of Study		Year 2	Year 1	Year 4
Games-Howell	Mean	3.279	3.368	3.410
Year 1	3.368	0.089		
Year 4	3.410	0.131	0.042	
Year 3	3.574	0.295	0.206	0.164

As shown in Table 8, a statistically significant difference for level of study was observed, favoring Year 3 students ($M = 3.57$, $SD = 0.29$) more than Year 4 students ($M = 3.41$, $SD = 0.13$), Years 2 students ($M = 3.28$, $SD = 0.09$) and Year 1 students ($M = 3.36$, $SD = 0.042$) in Arabic language practice.

To detect significant differences between Housemates (From one country (Malaysia) only or the various states (Malaysia) or A variety of countries, including Jordan), the researcher used the Games-Howell test to analyze the language practice scores and the results are shown in [Table 9].

Table 9. Games –Howell test the degree of practice by variable Housemate

Housemates		From one country (Malaysia) only	The various states (Malaysia)
Games-Howell	Mean	3.286	3.395
the various states (Malaysia)	3.395	0.108	
A variety of countries, including Jordan	3.946	0.660	0.551

The differences that appeared of housemates as in the Table 9 were in favor students of variety of countries including Jordan ($M = 3.95$, $SD = 0.66$) compared with from one country (Malaysia) ($M = 3.29$, $SD = 0.11$) and the various states (Malaysia) ($M = 3.39$, $SD = 0.55$) in Arabic language practice.

To detect significant differences between CGPA (84 and above or 68-75 or 76-83 or 68 and below), the researcher used the Games-Howell test to analysis the language practice scores and the results are shown in [Table 10]

Table 10. Games –Howell test the degree of practice by variable C. Average GPA

C. Percentage G.P.A.		68 and below	84 and above	68-75
Games-Howell	Mean	3.172	3.206	3.373
84 and above	3.206	0.034		
68-75	3.373	0.201	0.167	
76-83	3.466	0.294	0.260	0.092

Table 10 presents a statistically significant difference for CGPA, which favored students of 76 to 83 ($M=3.47$, $SD=0.29$) compared with 68-75 ($M=3.37$, $SD=0.09$), 84 to ($M=3.21$, $SD=0.17$), 68 and below ($M=3.17$, $SD = 0.03$) in Arabic language practice.

CONCLUSIONS

The overall result showed that participants have a medium level in practice (academic and social media) Arabic language. Michael and Ibrahim (2013) described Malaysians as naturally simple, calm, timid, and low in initiative compared with Jordanians who Malaysian students perceived as having a strong and serious personality. Simultaneously, the findings in the present study are similar to those of Michael and Ibrahim (2013) who argued that Malaysian students are weak in using the Arabic language and practice this language less intensively than native speakers. Moreover, Malaysian students tend to avoid conversing in Arabic with others. According to Ismail, Mahmod, Qadous, and Mohamed (2013), the Malaysian students who study abroad said during the interviews conducted by the researchers, one challenge they face in the academy is the language, because the lecturers, local students and the university staff do not use the standard Arabic language in their communication. This makes the Malaysian students confused and anxious as they read books and references in standard Arabic. Thus, they will refrain from participating and interacting with classroom climate or outside the classroom. (Barron, 2006; Saghir, 2001; Tinto, 1996). In this regard, Macintyre (1998) suggested that to address this weakness, a comfortable environment should be established inside the classroom to increase the confidence of students and encourage them to communicate in Arabic with others. Concurrently, teachers should create suitable classroom conditions for Malaysian students to motivate and promote communication with others inside the classroom.

Malaysian students will subsequently develop a positive attitude toward Arabic language practice (Ushida, 2005). Furthermore, Haron, Ahmad, Mamat, and Mohamed (2010) suggested that from the academic practice side knowledge of vocabulary and grammar seem to be inseparable and indispensable to speak a second language, because in order to say something learners must have the knowledge of vocabulary and grammatical structure to form sentences correctly. The result also found that students prefer to do academic practice on Arabic language more frequently than social media practice. The reason more likely academic language is typically found in textbooks, it always used in the classrooms for education purpose (Bailey, 2007), probably because the participants are residing outside their countries, so they resort to using social media much more to connect with relatives and friends in their own language. Thorne (2010) declared that the upsurge of online social interaction may be attributed in part to a desire to connect with new people, to share opinions, to stay in touch with old friends and colleagues, and to share different types of information with a widespread community of followers. Mikal and Grace (2012) commented that social media and electronic connections to family members can reduce stress and help with psychological adjustment in those living in abroad. And emotionally well-adjusted students find it easier to enjoy their experience in a foreign culture and more satisfying to engage with locals (Mikal, Yang, & Lewis, 2014).

This study concluded that there are significant difference in Malaysian male and female students in practice, with the results favoring male respondents. This finding differed from that in Malek, Noor-Azniza, and Farid, (2011) where the results revealed no gender differences. With regard to this, Cook's (1995) study shows that female students face a lot of the problems during the adjustment and the establishment of relations on campus compared with male students.

Ismail, Mahmud, Qadous, and Mohamed (2013) resulted that it is clear that the marital status factor has a great role in the adjustment and is very important for the students who are under pressure during their studies. This study results favored respondents who were married in practice Arabic language. Although (Ismail, Zailaini, Mohamed, Ali & Xuan, 2015; Poyrazli & Kavanaugh, 2006) concluded that unmarried students reach higher levels of adjustment compared to married students, because most of the married students living abroad leave their wives behind. But the Malaysians students in the current study are residing in Jordan with their wives so the factor of marital status is a positively contributing factor in helping them to adjust and cope with the difficulties.

As for the result on the statistical differences, we can see that students whose housemate come from a variety of countries (including Jordan) were favored in Arabic language practice more than students living with housemates from the same country. Bergström, Klatte, Steinbrink, and Lachmann (2016) described "Immersion appears to be a successful method for early second language learning; it fosters second language receptive skills without any cost for the first language."

Additionally, Cohen (1990) supports the teaching context should with the intent that learners become active, independent users of the strategies wherever they see opportunities to do so; this can make students become self-regulated learners and help them to overcome the challenges they meet and acquire the language. Ushida (2005) emphasized that teachers should create a unique class culture that will affect student motivation and attitude toward second language study. Teachers should also demonstrate the skills at a high degree, better than those practicing language at the low level.

REFERENCE

- Abd Assalam, Khalid, (2012). The mechanism of First language acquisition from cognitive Perspective. *Journal of Human Sciences and Literature*, Volume 15, Algeria.
- Ahmad, Radhaw. (2011) The impact of the multimedia in definition the new words for those who are acquiring Arabic language in the middle academic level in International Islamic University in Malaysia, an article presented in the international conference for Arabic language learning in China, was referred on 1/10/2014 form: <http://www.ukm.my/sapba/prosiding%20sapba11.htm>
- Álvarez Valencia, J. A. (2015). Language views on social networking sites for language learning: The case of Busuu. *Computer Assisted Language Learning*, 1-15.
- Anderson, J. R. (2000). *Learning and memory. An integrated approach*. 2nd Edition. John Wiley & Son, Inc.
- Aveni, V. A. P. (2005). *Study abroad and second language use: Constructing the self*. Cambridge University Press.
- Bailey, C. A. (2007). *A Guide to Qualitative Field Research* 2nd Edition
- Barron, P. (2006). Stormy outlook? Domestic Students' impressions of international students in Australian university. *Journal of Teaching in Travel & Tourism*, 6, 5 -22
- Bergström, K., Klatte, M., Steinbrink, C., & Lachmann, T. (2016). First and Second Language Acquisition in German Children Attending a Kindergarten Immersion Program: A Combined Longitudinal and Cross-Sectional Study. *Language Learning*, 66(2), 386-418.
- B Raban, M Brown, E Care, F Rickards & O'Connell, T. (2011). Young Learners — Learning and Literacy in the Early Years. AARE International Education Research Conference, 29 Nov – 3 Dec 2009, www.aare.edu.au/09pap/rab091255.pdf.
- Cohen, A. D. (1990). *Language learning: Insights for learners, teachers, and researchers*. Heinle & Heinle Publishers.
- Cook, S. L. (1995). Acceptance and expectation of sexual aggression in college students. *Psychology of Women Quarterly*, 19(2), 181-194.
- David Kent. (1997). The Practice of TESOL & The Effect of Individual Variables Upon TESOL Students. *The Internet TESL Journal*, Vol. 4, No. 4. Retrieved from <http://iteslj.org/Articles/Kent-PracOfTESOL.html>

- DeKeyser, R. (1998). *Beyond focus on form: Cognitive perspectives on learning and practicing second language grammar*. Focus on form in classroom second language acquisition, 42-63.
- DeKeyser, R. (Ed.). (2007). *Practice in a second language: Perspectives from applied linguistics and cognitive psychology*. Cambridge University Press.
- Education Scotland. (2015) *Modern language Principles and practice*. Retrieved from <http://www.educationscotland.gov.uk/learningandteaching/curriculumareas/languages/modernlanguages/principlesandpractice/index.asp>
- Ericsson, K. A. (1996). *The acquisition of expert performance: An introduction to some of the issues*.
- Ericsson, K. A. (2004). Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains. *Academic Medicine*, 79(10), S70-S81.
- Ericsson, K. A. (2006). The influence of experience and deliberate practice on the development of superior expert performance. *The Cambridge handbook of expertise and expert performance*, 683-703.
- Ericsson, K. A., & Charness, N. (1994). Expert performance: Its structure and acquisition. *American Psychologist*, 49(8), 725.
- Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), 363.
- Harmer, J. (1991). *The practice of English language teaching*. London/New York.
- Haron, S. C., Ahmad, I. S., Mamat, A., & Mohamed, I. H. A. (2010). Understanding Arabic-speaking skill learning strategies among selected Malay learners: A case-study at the International Islamic University Malaysia (IIUM). *Contemporary Issues in Education Research*, 3(8), 9.
- Howell, D. (2012). *Statistical methods for psychology*. Cengage Learning.
- Ismail, W., Mahmod, Z. A., Qadous, A. I., & Mohamed, M. F. (2013). A study of adjustment (academic, social and to the urban environment) among Malaysian students at Jordanian universities and its correlation with their academic achievement. *OIDA International Journal of Sustainable Development*, 6(06), 23-36.
- Ismail, W., Zailaini, M. A., Mohamed, M. F., Ali, S. K. S., & Xuan, D. (2015). The relationship between social adjustment and practice of second language among non-native speakers of Arabic. *International Journal of Social Science & Human Behavior Study– IJSSHBS Volume 2 : Issue 2 [ISSN : 2374-1627] Publication Date: 19 October, 2015*
- Gastwirth, J. L., Gel, Y. R., & Miao, W. (2009). The impact of Levene's test of equality of variances on statistical theory and practice. *Statistical Science*, 343-360.
- Gray, C., Pilkington, R., Hagger-Vaughan, L., & Tomkins, S. A. (2007). Integrating ICT into classroom practice in modern foreign language teaching in England: making room for teachers' voices. *European Journal of Teacher Education*, 30(4), 407-429.

- Grahl, B. (2013) 'The media of social media'. Available from <http://tristantreadwell.wordpress.com/tag/grahl/> [Accessed 12 May 2014].
- Godwin-Jones, R. (2016). Emerging technologies integrating technology into study abroad. *About Language Learning & Technology*, 1.
- Kinginger, C. (2013). Identity and language learning in study abroad. *Foreign Language Annals*, 46(3), 339-358.
- Kinginger, C. (2004). Alice doesn't live here anymore: Foreign language learning and identity reconstruction. *Negotiation of identities in multilingual contexts*, 21(2), 219-242.
- Latifah binti Abdul Latiff. Arabic inscription in Malaysia: *A study of their historical significance*. Kuala Lumpur, Malaysia: IIUM, 2004.
- Lightbown, P.M. & Spada, N. (2002). *How languages are learned* (2nd edn.). Oxford: Oxford University Press.
- 12
- MacIntyre, P. D. (1998). Language anxiety: A review of the research for language teachers. In Young(ed.). *Affect in foreign language and second language learning*. New York. McGraw-Hill College.
- Malek, T. J., Noor-Azniza, I., & Farid, T. M. (2011). Emotional intelligence in modifying social and academic adjustment among first year university students in North Jordan. *International Journal of Psychological Studies*, 3(2), 135.
- Michael, Ibrahim, The impact of the trends and emotions at the interest of using Arabic language in the communication process. A case study to Arabic language learners as a second language in International Islamic University in Malaysia. *Journal of Education and Psychology Studies*, 7(3)333-343 2013.
- Mikal, J. & Grace, K. (2012). Against Abstinence-only Education Abroad: An analysis of how students are using the Internet to enhance study abroad, *The Journal of Studies in International Education*, 16(3), 287-306.
- Mikal, J. P., Yang, J., & Lewis, A. (2014). Surfing USA: How Internet use prior to and during study abroad affects Chinese students' stress, integration, and cultural learning while in the United States. *Journal of Studies in International Education*, 1028315314536990.
- Oberg, K. (2006). Cultural shock: *Adjustment to new cultural environments*. *Curare*, 29(2), 3.
- Pallant, Julie (2007). *SPSS Survival Manual A Step by Step Guide to Data Analysis Using SPSS for Windows*. Third Edition. Open University Press. England.
- Pufahl, I., Rhodes, N. C., & Christian, D. (2000). *Foreign Language Teaching: What the United States Can Learn from Other Countries*. ERIC Clearinghouse on Languages and Linguistics Report.
- Poyrazli, S, Kavanaugh, P. (2006). Marital status, ethnicity, academic achievement, and adjustment strains: the case of graduate international students. *College Student Journal Publisher*. ISSN: 0146-3934, 40, 4.
- Saghir, S. (2001). *Social adjustment for international students: an analytical study applied to foreign students at King Saud University in Riyadh*. *Journal of Educational and Social Sciences, and Humanities*. Umm Al-Qura University. Saudi Arabia Retrieved from <http://repository.yu.edu.jo/handle/123456789/52> 5940

- Simon, J., & Ainsworth, J. W. (2012). Race and socioeconomic status differences in study abroad participation: The role of habitus, social networks, and cultural capital. *ISRN Education*, 2012.
- Smith, T., & Renk, K. (2007). *Predictors of academic related stress in college students: An examination of coping, social support, parenting, and anxiety* [Electronic version]. *NASPA Journal*, 44(3), 405-431.
- Sonnentag, S., & Kleine, B. M. (2000). Deliberate practice at work: A study with insurance agents. *Journal of Occupational and Organizational Psychology*, 73(1), 87-102.
- Shortis, T. (2001). *The language of ICT: Information and communication technology*. Psychology Press.
- Tinto, V. (1996). Reconstructing the first year of college. *Planning for Higher Education*, 25(1), 1-6.
- Thorne, S. L. (2010) 'The 'Intercultural turn' and language learning in the crucible of new media,' in Helm, F. and Guth, S. (eds.), *Telecollaboration 2.0 for Language and Intercultural Learning*. Bern: Peter Lang: 139-164.
- Ushida, E. (2005). *The role of students' attitudes and motivation in second language learning in online language courses*. *CALICO Journal*, 23(1), 49-78.
- Zubairi, A. M., & Sarudin, I. (2009). Motivation to learn a foreign language in Malaysia. *GEMA Online Journal of Language Studies*, 9(2), 73-87.

Active Methodologies for Improving Competencies in Project Management

Dante GUERRERO

Universidad de Piura, Peru

dante.guerrero@udep.pe

Catherin GIRON

Universidad de Piura, Peru

catherin.giron@udep.pe

ABSTRACT

This article aims to assess the influence of a methodological strategy, based on new active methodologies, designed for the development of professional competences in the management of projects, which are necessary for the good development in the labor market of future industrial engineers. The analysis shows that there is an improvement in the student's knowledge regarding these competences. This development is contrasted with the growth that the learner perceives in his/her competences, with the purpose of proposing improvements to the designed strategy.

First of all, there is an independent analysis of the student's perception of his/her competences and the actual knowledge gained from these competences, and then to compare both developments in a general way, in each area of competence and in a specific way in each element of competence. The results show, through the comparison of the students' states taking the Engineering Projects course, that there is strong evidence of improvement of competences with high statistical significance that can be attributed to the evaluated learning process.

INTRODUCTION

Given the constant change and current economic and social development that society is experiencing, where systems are increasingly large and where social rather than technical issues play increasingly important roles, problems cannot be solved by applying only one technical solution to achieve the expected efficiency and effectiveness. It is therefore important, that engineers be trained not only in terms of their particular technical field, but also their ability to identify non-technical aspects of problems, the interaction between these aspects and possible solutions (Lehmann, Christensen, Du, & Thrane, 2008). Therefore, there is a greater requirement for engineers, who must develop their skills to: innovate, solve complex problems, work in multidisciplinary contexts and practice their profession either as generalist or specialist, but always adapting to technological advances (Ramírez, 2009; Guerrero & La Rosa, 2014)

Today, the training of the engineer is a challenge, since it is certainly not an easy task to introduce and integrate these aspects in engineering education that require innovative approaches, in addition to the globalization of markets, the large amount of information available, the increasing complexity of the problems and projects that must be faced in their profession (Fernández & Duarte, 2013). In this new context, the conception of competences constitutes the essential basis of the professional world and, therefore, becomes a key element of any educational model, since the competences that society demands must be considered when designing any educational strategy (De los Ríos, Cazorla, Díaz-Puente, & Yagüe, 2010).

Technological, economic, social, cultural and political changes define new profiles in view of what companies need from their professionals and engineering education must consider these changes, as it constantly seeks to develop and adapt new pedagogical and didactic strategies helping the training of engineering professionals with the skills required by increasingly dynamic work and social environments (Fernández & Duarte, 2013). It is important that these new learning methodologies enable the outlining of general competences, necessary in a professional of today, as well as specific competences, which depend on each academic program or area of knowledge.

The present research work is framed within the necessary competences in a project manager or any person who manages part of it. This approach to project development motivates young people to learn because it allows them to select topics that interest them and are important to their lives and develop them through a project, experiencing real situations regarding what they will face in their professional life (Katz & Chard, 1989). This paper explains the impact of a methodological structure based on active methodologies with an emphasis on Project Based Learning (PBL) for the development of project management competences in students of Industrial and Systems Engineering and shows sufficient evidence of the significant improvement in these students' learning. The methodology was used in the course Projects in the Degree of Industrial and Systems Engineering of the University of Piura in Peru. The data of 2016 is taken as a study base, however, it should be noted that the methodological strategy has been implemented since 2011 with improvements in each year according to the students' achievements and the feedback received from them. The PBL is a learning model in which students plan, implement and evaluate projects that have real-world application beyond the classroom, fostering their interest in the problems of their social environment (Galeana, 2006; Blank, 1997; Dickinson et al., 1998; Harwell, 1997). These projects are complex tasks, based on difficult questions or problems, involving students in design, problem solving, decision making, even in research activities (Cörvers, Wiek, De Kraker, Lang, & Martens, 2016; Jones, Rasmussen, & Moffitt, 1997).

The research is defined in three sections and the final conclusions. The first part explains the concept of competence as a starting point to understand what is meant by competence in the management of projects and which ones are those. Then the methodology used in the course is explained, i.e. the methodological structure under which is taught to the students, as well as the methodology used in this research. As a third point the findings are presented when analyzing the students' results obtained within the course. Finally, the research will provide the conclusions and recommendations.

COMPETENCE

There are different definitions of the word competence, as it is customary to talk about it. It is normally understood as an amplification of the concept of ability and qualification resulting from rapid technical developments in the organization of work and planning activities. However, the holistic approach defines competence as the result of a mix of underlying personalities, such as communication, self-development, creativity, problem analysis and problem solving, which are called meta competences which enable the existence of cognitive, functional, behavioral and ethical values that together determine professional competence (Guerrero, De los Ríos, & Díaz-Puente, 2008). This makes the holistic approach as the most appropriate for the codification of competences for obtaining academic degrees in higher education, even in engineering. The International Project Management Association (IPMA), following this holistic approach, has identified 46 project management competences, which are grouped into three dimensions: behavioral competences, technical competences and contextual competences (see Figure 1).

Technical competences	Behavioural competences	Contextual competences
1.01 Project management success	2.01 Leadership	3.01 Project orientation
1.02 Interested parties	2.02 Engagement & motivation	3.02 Programme orientation
1.03 Project requirements & objectives	2.03 Self-control	3.03 Portfolio orientation
1.04 Risk & opportunity	2.04 Assertiveness	3.04 Project programme & portfolio implementation
1.05 Quality	2.05 Relaxation	3.05 Permanent organisation
1.06 Project organisation	2.06 Openness	3.06 Business
1.07 Teamwork	2.07 Creativity	3.07 System, products & technology
1.08 Problem resolution	2.08 Results orientation	3.08 Personnel management
1.09 Project structures	2.09 Efficiency	3.09 Health, security, Safety & environment
1.10 Scope & deliverables	2.10 Consultation	3.10 Finance
1.11 Time & project phases	2.11 Negotiation	3.11 Legal
1.12 Resources	2.12 Conflict & crisis	
1.13 Cost & Finances	2.13 Reliability	
1.14 Procurement & contract	2.14 Values appreciation	
1.15 Changes	2.15 Ethics	
1.16 Control & reports		
1.17 Information & documentation		
1.18 Communication		
1.19 Start-up		
1.20 Close-out		

Figure 1. Competences in Project Management under the IPMA approach (IPMA, 2009)

METHODOLOGY

Methodological Strategy

The project course is taught to students of the last year of the Industrial and Systems Engineering of the University of Piura, and its main objective is to provide students with methodological tools for project management. The course is based on general project knowledge and international standards, and the development of project management competences, under the approaches of the International Project Management Association (IPMA, 2009) and the Project Management Institute (2008). In addition, both approaches are used to design a methodological strategy that promotes the adequate development of the competences in project management.

This strategy is a mix of new active methodologies, with a greater emphasis on project-based learning (PBL), but other activities are also included. The PBL allows students to form teams integrated by people with different profiles, where they acquire, use and apply the concepts of the subject through their research, developing skills in the planning, implementation and evaluation of projects that have application in a real world that goes beyond the classroom. Other teaching-learning methodologies used are collaborative work; case-based learning, problem-based learning, all of these methodologies presented in different research (Bará, 2003; Blank, 1997; Dickinson, et al., 1998; Galeana, 2006; Harwell, 1997; Jenkins & Lackey, L.W, 2005; Jones, Rasmussen, & Moffitt, Real-life problem solving.: A collaborative approach to interdisciplinary learning, 1997; Menéndez, 2003; Thomas, 2000).

This strategy is steadier over the last 5 years, where the results obtained year by year are evaluated by the students who take the course and improvements are made so that the student can better achieve the course objectives. Students not only listen to lectures, but also have workshops where the theory is combined with the practical part, encouraging them to apply the knowledge they acquire to a real project developed by them, as well as to use case studies and examples of real projects. The course encourages self-study with the use of information and communication technologies, as they have a platform where they can access complementary reading and case studies in order to promote the acquisition and development of project management skills.

During the term the student must develop a project in a group of 5 people, where they can solve a problem, meet a need or create a business opportunity, in parallel with this, the student is developing deliverables regarding the direction of his/her project. In this way, the student not only develops knowledge and attends to a current problem but also develops interpersonal skills of teamwork and interaction with other actors such as companies in the region, communities, managers, among other interested parties, that are the key factors of their project success and with which they must interact in the professional field.

This methodological structure also considers the method of evaluation of the learning expected by the student, including the student's perception. At first, the student of the course assesses his/her own competence that allows him/her to identify his/her state regarding the competences in project management, which will be contrasted at the end of the course with another self-assessment. The student's knowledge of competences is measured by written examinations, following the characteristics of the written examination for IPMA level D and include questions from the 46 competences. The students receive immediate feedback, which helps them to identify their weaknesses.

The student must carry out a semester project that is reflected in a report and an exhibition under certain criteria that are directly related to the graduate career profile required. The professor provides guidance in a personal way and reinforces this role with monitors for each group, who are certified in the IPMA management projects, and are in charge of accompanying the team throughout the project, solved doubts, providing advice in the formulation, design and implementation. Likewise, the student's continuous participation in the workshops, the project assessments and the formal evidences in the acquisition of competences and the formal presentation of deliverables are evaluated.

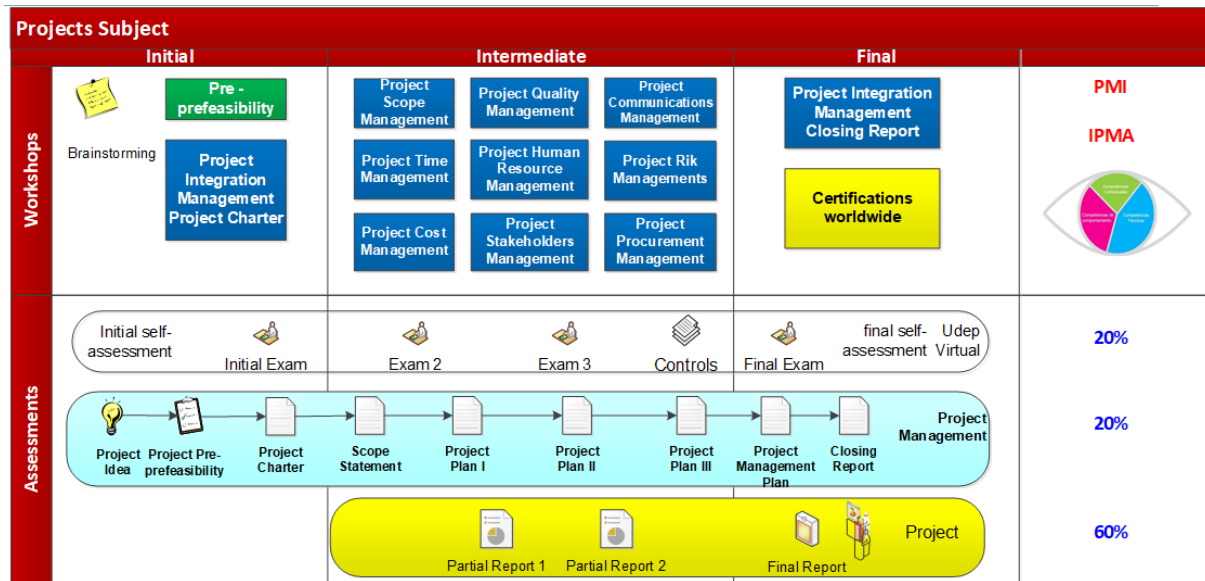


Figure 2. Methodological Structure 2016

In the year 2016, controls have been included in each class which allow the student to be in a constant evaluation of their knowledge; exhibitions about the direction of their project by the students that allows the development of communication skills, a workshop on human talent and situations that emphasize behavioral competences. The methodological structure is presented in Figure 2, where it is possible to visualize, through the workshops, the subjects studied in relation to the competences in, as well as the evaluations taken in the semester 2016 and the formal documents requested in the semester. The student must formally present the documentation regarding the project management.

Research Methodology

The sample is 43 students of the course of Project Management of the semester II of 2016, who receive the methodological structure discussed above. From the evaluation system presented, it is decided to take two evaluation instruments: the exams and the self-assessments, since they both have enough data expressed in an objective way and through a system that can be measured by competence.

In order to evaluate the learning process and its influence in the acquisition of project management competences in industrial engineering students, the following questions are raised: (1) Is there a development of project management competences by the students of the project course in both evaluation instruments? (2) Is the perception of competence development on the part of the students and the development presented in their exams the same?

In order to know if the difference obtained when comparing two samples of data is statistically significant, tests of hypotheses are made that enables to compare the means of two samples. In this research the same individuals will be assess, at different times and before different evaluations, therefore, the results of each evaluation are taken as a different data sample. We compare the results obtained in the initial exam, the final exam, the initial and final self-assessments (student perception). Therefore, the hypothesis for this investigation is given by:

- Null hypothesis: The means to analyze are equal.
- Alternative hypothesis: The mean 1 is different from the mean 2.

A statistical analysis is performed, making a t-Student test where a confidence interval for the difference between the means is constructed. Since the confidence level established for this investigation is 96%, the P values obtained when comparing the means should be less than 0.04 to indicate that the results are statistically significant. For this case, it is assumed that the variances of the two samples are the same, based on Test F for the comparison of standard deviations obtained in the same program that is used to compare the means. The program used is STATGRAPHICS Centurion which enables comparisons as well as graphical results of the samples.

First, there are general results regarding the behavior of the 4 evaluations according to the range of competence. In the first section of the results a comparison of the initial and final self-assessments is made to identify the development perceived by the student, which is a good source of information, since it not only involves the acquired knowledge but also other factors that lead to indicate if there is an increase in their competences. In this first analysis a statistical analysis of the areas of competences are presented, as well as the identification of competences with greater significant development for each area.

In the second section, a comparison is made between knowledge at the beginning of the course and at the end of the course, in order to identify if there is a significant difference in the groups of competences, evidencing the development in the professional competences of the students. It should be noted that the degree of difficulty of the exams is increasing, for the first exam a level 8 exam in the IPMA scale (0 to 10) is made and in the final exam a level 10 exam on the IPMA scale is given. To analyze the 47 competences, a comparative analysis of the average of the scores obtained in each competence is carried out, in order to identify the competences with the greatest significant development.

Finally, the student's perception regarding the development of his professional competences and the real increase of the knowledge of the professional competences obtained is analyzed. In this way, it will be identified if the variation of knowledge is recognized by the student, as well as if the student recognizes the state in which he/she initiates and the state he/she arrives in order to identify if there is an overvaluation or undervaluation of the knowledge acquired. In this last section it is also graphically presented the comparison of the scores of both evaluation instruments for each scope, as well as the average scores obtained in each competence in its initial and final state. The results presented are supported by a statistical analysis, and the graphs obtained are representative of the sample taken.

FINDINGS

Figure 3 presents an overview of the evaluations analyzed for the present research. It can be observed that graphically there is an increase in the three areas of competence independently of the evaluation instrument, i.e. there is graphically an increase in both self-assessments, when comparing Initial Self-Assessment and Final Self-Assessment, as in the exams when comparing Initial Exam and Final Exam. It is also clearly observed that the score obtained in the Final Exam is higher than the other assessments in the three areas.

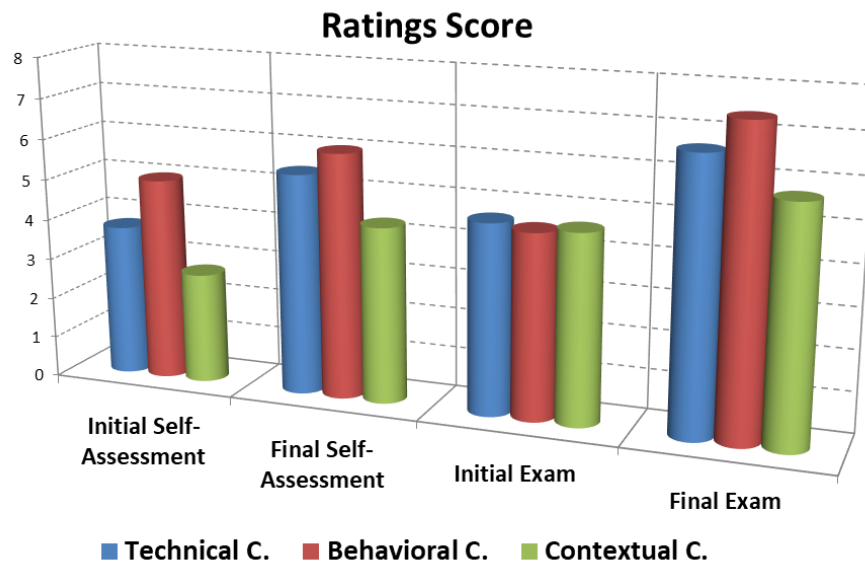


Figure 3. Overview of Assessment

Figure 3 also shows that the level at which students start is similar in the three domains of competences according to the initial examination, however, the student in the self-assessment considers to have a greater knowledge of behavioral competences than the other domains and even indicate a higher score than the one obtained in the initial examination. On the contrary, in the final evaluations it can be observed that the student, upon self-assessment, considers having a lower knowledge of what was actually achieved at the end of the course.

The results will be presented in detail as follows. It will be analyzed if the difference observed graphically between the instruments of evaluation is statistically significant, in both the initial and final state of the evaluation instrument, as well as between the two different evaluation instruments. The detailed analysis of competences with the greatest significant development will also be carried out.

Self-assessment

The results when analyzing this evaluation instrument reflect the student's perception regarding the knowledge in management competences of acquired projects.

[Table 1] shows the statistical analysis by means of the t-Student test for the self-assessments in the areas of competences in project management. It can be affirmed that there is a significant difference to 96% in the three areas of competences; that is to say, there is an improvement perceived by the students. Since the P-value shown in the last column is less than 0.04 which means the rejection of the null hypothesis.

Table 1: Statistical analysis of self-assessment

Range of Competence	I.S.	F.S.	$\Delta A\%$	t-Student	P-Value
Technical C.	3.73	5.43	16.9%	-6.681	0.0000
Behavioral C.	4.99	6.01	10.2%	-3.804	0.0003
Contextual C.	2.72	4.32	16.1%	-5.523	0.0000

Note: I.S. = initial self-assessment, F.S. = final self-assessment.

In the case of Technical C. there is an increase of 16.9 percentage points, slightly higher than the increase of 16.1 percentage points in Contextual C. and with greater difference than those of Behavior (10.2%), however, the highest score is given by the behavioral competences which reach a score of 6.01 on a scale of 1 to 10. It means that students perceive that they possess a higher degree of behavioral competence both at the beginning of the course and at the end of the course, and this has a great sense because of the human formation that the group receives in addition that many of the students already have experience in the labor field, which has led them to develop some of these competences.

With regard to technical competences, it is discovered that 18 competences of the 20 present a statistically significant development, since they obtain a P-value lower than 0.04 that means that the null hypothesis is rejected and in this way it is affirmed that there is an improvement of the competences in 90% of the competences of this area when the student assesses his/her own competence. [Table 2] presents the technical competences that obtained a difference greater than or equal to 20 percentage points.

Table 2: Technical Competences with greater development - Self-Assessments

Competence		I.S.	F.S.	$\Delta S\%$	t-Student	P-Value
1.20	Close-out	2.34	5.07	27%	-5.961	0.000
1.04	Risk and Opportunities	3.30	5.93	26%	-5.963	0.000
1.01	Project management success	2.93	5.50	26%	-6.856	0.000
1.14	Procurement and contracts	1.32	3.67	23%	-6.085	0.000
1.12	Resources	3.34	5.50	22%	-5.751	0.000
1.17	Information and documentation	3.68	5.79	21%	-4.570	0.000
1.10	Scope and deliverables	4.20	6.29	21%	-4.701	0.000
1.03	Project requirements and objectives	4.50	6.57	21%	-4.592	0.000

Note: I.S.= initial self-assessment, F.S. = final self-assessment, $\Delta S = F.S - I.S$

The close-out competence has the perception of a higher improvement; a cause might be because it is the last subject in which it is deepened and the one closest to the final self-assessment. Also, the competence for project management success is a competence with great development, being for many students the first time they relate to everything that involves a project and specifically in how to deal with success when managing it, which implies to go beyond the success of the project itself. Similarly, new topics for students are risk and procurement management. In addition, it can be observed that the student recognizes that there is an improvement in the competences linked to the objectives and the scope of the project, since it is an area that works with greater emphasis due to its importance.

The elements of behavioral competence present a smaller difference between the initial and final state than that presented in the elements of technical competence, which indicates a lower development. It can be identified that there is a significant development in 9 of the 15 competences, i.e. it can be affirmed that in 60% of the elements of this area of competence there is a statistically significant increase with a reliability of 96%. In [Table 3] the

competences have been placed with a difference greater than or equal to 15%; it can be observed that the P-values are smaller than 0.04.

Table 3: Behavioral Competences with greater development - Self-Assessment

	Competence	I.S.	F.S.	$\Delta S\%$	t-Student	P-Value
2.12	Conflicts and Crises	3.80	5.52	17%	-3.894	0.000
2.05	Relaxation	4.52	6.07	15%	-3.431	0.001
2.03	Self-control	5.27	6.79	15%	-3.802	0.000
2.09	Efficiency	4.50	6.00	15%	-3.900	0.000
2.11	Negotiation	3.86	5.36	15%	-3.218	0.002
2.08	Results Orientation	4.05	5.50	15%	-3.400	0.001

Note: I.S.= initial self-assessment, F.S. = final self-assessment, $\Delta S = F.S - I.S.$

According to the student's perspective, the most developed behavioral competence element is Conflict and Crisis; Although students have worked in groups previously, completing a full project involves working under situations with greater pressure, as well as there are different parts working together with their own different objectives, but must be integrated to achieve a common goal, which is the project's objective. Another important competence is the negotiation, because the student relates not only with his/her peers but also with professionals immersed in the project's area they are developing, as well as with people outside the project and all those interested in it.

All elements of contextual competence present a significant development in self-assessments. The main reason is that many of the students were not familiar with the competences of this area, since these elements of competence are related to the context of a project, a completely new area for most of the students, and when they assess themselves, at the end, they think that they have acquired knowledge in this area by the fact of carrying out a project in a real context. [Table 4] shows the elements with a difference greater than 15 percentage points. Basically, they are the elements directly related to project management.

Project orientation is the term used to describe the orientation of organizations in the administration of projects and the development of the competence for the project management; which is why the student perceives to have a greater development of this competence because they carry out a project, managing and directing it to the success.

Table 4: Contextual Competences with greater Development - Self-Assessment

	Competence	I.S.	F.S.	$\Delta S\%$	t-Student	P-Value
3.01	Project Orientation	2.89	5.36	25%	-6.163	0.000
3.06	Business	2.82	4.79	20%	-4.549	0.000
3.05	Permanent organizations	1.80	3.69	19%	-4.391	0.000
3.08	Personnel management	3.70	5.36	17%	-3.534	0.001
3.03	Portfolio Orientation	1.43	3.05	16%	-3.882	0.000
3.04	Projects, programs and portfolios implementation	2.36	3.83	15%	-3.291	0.001

Note: I.S.= initial self-assessment, F.S. = final self-assessment, $\Delta S = F.S - I.S.$

Exams

The results when comparing the initial and final knowledge according to the scope of competences are favorable in the 3 groups, since there is a significant difference to 96%, which means that the methodological strategy helps in the acquisition and development of competences in Project management. [

Table 5] presents the statistical analysis for this evaluation instrument, indicating that there is a significant increase of 19.6 percentage points in the technical competence, 28.8 in the behavioral competence and 11 in the contextual competence. Contrary to what happens in the self-assessments, the greater development, under this evaluation instrument, is given in behavioral competences. It is also the area with the highest mean in the final exam. This means that the student acquires greater knowledge regarding the personal aspect that a professional

must have for the Project Management, that is to say that the student develops a broader knowledge of the skills and attitudes that a Project Manager must have.

Table 5: Statistical analysis of knowledge

Range of Competence	I.E	F.E	$\Delta E\%$	t-Student	P-Value
Technical C. (TC)	4.66	6.63	19.6%	-7.713	0.0000
Behavioral C. (BC)	4.53	7.41	28.8%	-10.875	0.0000
Contextual C. (CCx)	4.63	5.72	11%	-4.002	0.0001

Note: I.E. = Initial Exam, F.E. = Final Exam, $\Delta E = F.E. - I.E.$

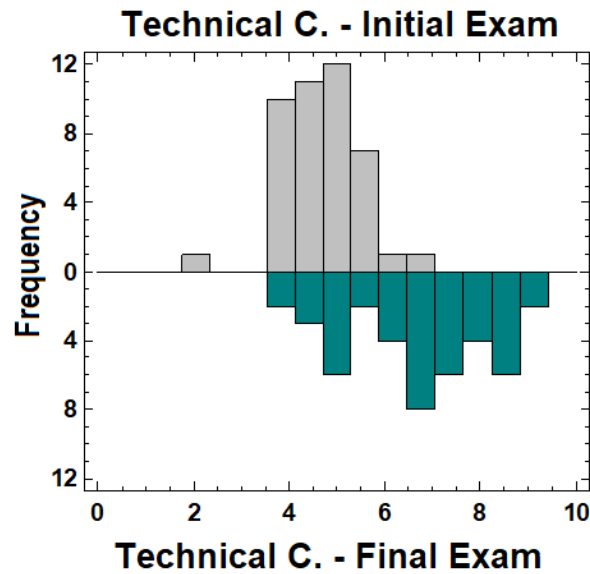


Figure 4. Distribution of technical competences

Figure 4 shows the behavior of the scores obtained by the students in the area of the technical competence in both the initial and final examinations. There is a positive shift, with increase in the mean, the minimum and maximum score obtained and a greater dispersion.

[Table 6] presents the technical competence elements with significant development, with a P-value lower than 0.04 indicating that the means of the initial and final examination are not equal, therefore there is a statistically significant increase.

Table 6: Technical Competences – Exams

Competence		I.E.	F.E.	$\Delta E\%$	t-Student	P-Value
1.17	Information and documentation	2.82	8.41	56%	-5.224	0.000
1.10	Scope and deliverables	3.20	6.59	34%	-3.144	0.002
1.11	Time and project phases	3.23	6.27	30%	-2.823	0.005
1.05	Quality	4.55	7.27	27%	-2.565	0.010
1.02	Parties involved	4.49	7.14	26%	-2.491	0.013
1.19	Start-up	5.00	7.61	26%	-2.507	0.012
1.06	Project Organization	4.45	6.93	25%	-2.322	0.020
1.03	Project requirements and objectives	4.86	7.27	24%	-2.287	0.022

Note: I.E. = Initial Exam, F.E. = Final Exam, $\Delta E = F.E. - I.E.$

The biggest increase occurs in the information and documentation competence, which involves the management of information from its collection to the data retrieval of a project, including formats, optimal information to submit, a documentation system, standards, among others. Students, in the course, learn about the importance of good documentation and information to submit, as well as compliance with standards. Another important competence to highlight is "Scope and deliverables", because the scope of a project defines its limits, and if these are not defined well and are not properly documented, it may cause a lack of control in the project. The competences obtained in this analysis are directly related to the main pillars of the project success, which is one of the course objectives.

With regard to the behavior scope, Figure 5 shows that there is a large change; graphically, there is a quite marked shift to the right, which indicates scores increase in the group; the concentration of scores on the final exam is even higher than the highest score on the initial exam.

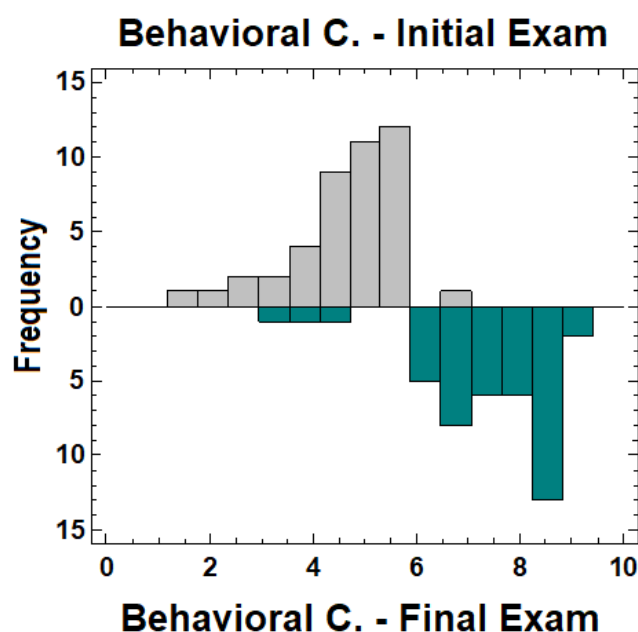


Figure 5. Distribution of behavioral competences

In the analysis carried out at the level of elements of this competence range, it can be obtained that 9 out of the 15 elements (60%) have increased their mean value statistically significant to a 96% reliability, see [Table 7].

Table 7: Behavioral Competences – Exams

Competence		I. E.	F. E.	$\Delta E\%$	t-Student	P-Value
2.14	Values Appreciation	2.36	9.55	72%	-6.793	0.000
2.15	Ethics	3.27	9.32	60%	-5.809	0.000
2.02	Engagement and motivation	3.64	9.55	59%	-5.783	0.000
2.03	Self-control	5.64	9.32	37%	-3.930	0.000
2.07	Creativity	2.36	5.91	35%	-3.343	0.001
2.01	Leadership	5.82	9.32	35%	-3.784	0.000
2.09	Efficiency	5.27	8.41	31%	-3.132	0.002
2.06	Openness	6.73	9.32	26%	-3.017	0.003
2.10	Consultation	1.27	3.86	26%	-2.750	0.006

Note: I.E. = Initial Exam, F.E. = Final Exam, $\Delta E = F.E. - I.E.$

The development of the knowledge reached in the behavioral range is high, since the students' reach scores close to 10 (in a scale of 1 to 10) in several of the elements. It is important to emphasize that the measurement of this development of these elements within the exams is through cases, where they must choose the best decision

against alternatives that are good. The student throughout the project can experience situations as those presented.

The importance of the elements can be and will be different according to the situation of the project, in this case from the perspective of the knowledge acquired, the students in this semester have a marked development in the appreciation of values, which relates specifically to mutual respect, as well as being able to understand other points of view and perceive the intrinsic qualities of other people. There is also a substantial development in the element of ethics and one of the reasons is that in the semester the students also complementary take a course of ethics for engineers, where issues related to professional ethics are studied and study cases are discussed in this regard.

Figure 6 shows the behavior of the contextual competence area distributions. A slight shift can be visualized together, but a visible shift of the mean, however, the tail is similar with greater intensity to the left side. This indicates that there is growth as a group, but maintaining the distribution form.

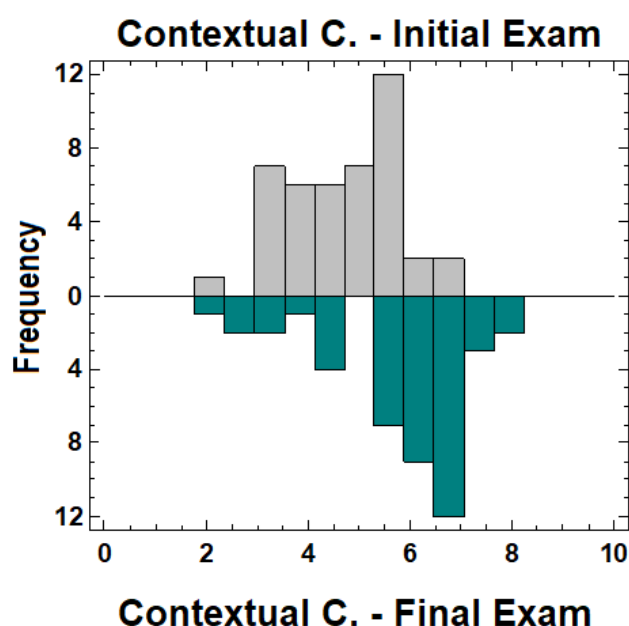


Figure 6. Distribution of contextual competences

There is a significant development only in 36% of contextual competence elements. One of the causes is that the level of exigency increases because in the first evaluation it is taken into account that the student is not related to subjects regarding the context in which a project operates, nevertheless, the scores obtained in this first examination are not so low, which shortens the difference, so that the variation is not statistically significant.

In [Table 8] contextual competences that have a significant development are presented, that is to say that the mean of the initial examination differs from the mean of the final examination, therefore a significant development is added to 96%. The developed competences are directly related to the project environment in the organization.

Table 8: Contextual Competences – Exams

Competence		I. E.	F. E.	$\Delta E\%$	t-Student	P-Value
3.03	Portfolio Orientation	3.91	9.09	52%	-5.036	0.000
3.05	Permanent organizations	2.91	7.73	48%	-4.479	0.000
3.11	Legal	4.55	7.95	34%	-3.256	0.001
3.02	Program Orientation	6.00	8.18	22%	-2.225	0.026

Note: I.E. = Initial Exam, F.E. = Final Exam, $\Delta E = F.E. - I.E.$

Knowledge vs. Perception

According to the statistical analysis presented in [Table 9], it can be seen that when comparing the initial state of the self-assessments and the exam, there is a significant difference in the technical and contextual competences, that is to say that the student perceives to know less about these areas of what they really know, since in the

exam they get a better score than in the self-assessment, in the case of the techniques 9.3 percentage points more and in the contextual ones, 19.1 percentage points.

Regarding the final state, it is observed that the P-value for this comparison is zero (FS=FE) in all three areas, i.e. the state they arrive at in the exams is different from the self-assessments; it is noticeable that the student assesses his/her own competence low with a perception of lower level with respect to his developed knowledge.

Regarding the variation analysis in both the competences and the self-assessments, it can be said that only in the behavioral competences there is a greater variation in the exams than that obtained in the self-assessments; this shows that there is a greater development in the exams than the student's perception. The variation in the exams is twice of the one obtained in the self-assessments.

Table 9: Statistical analysis of the perception of competence improvement and the developed knowledge

Competences range	Initial Self-Assessment (IS)	Initial Exam (IE)	Final Self-Assessment (FS)	Final Exam (FE)	ΔS	ΔE	IS=IE	FS=FE	$\Delta E = \Delta S$
Technical C.	3.73	4.66	5.43	6.63	1.69	1.96	0.000	0.000	0.362
Behavioral C.	4.99	4.53	6.01	7.41	1.02	2.88	0.073	0.000	0.000
Contextual C.	2.72	4.63	4.32	5.72	1.61	1.10	0.000	0.000	0.147

Figure 7 shows a graphical analysis of what happens to the technical competences with both evaluation instruments. It can observe the variation of initial and final state, which indicates a development in both perception and knowledge as a group, as the box-and-whisker plot has an upward shift. Thus, it can be seen that all students at the end of the course are above 4 points and 25% are between 8 and 9 points (on a scale of 1 to 10).

Technical Competences

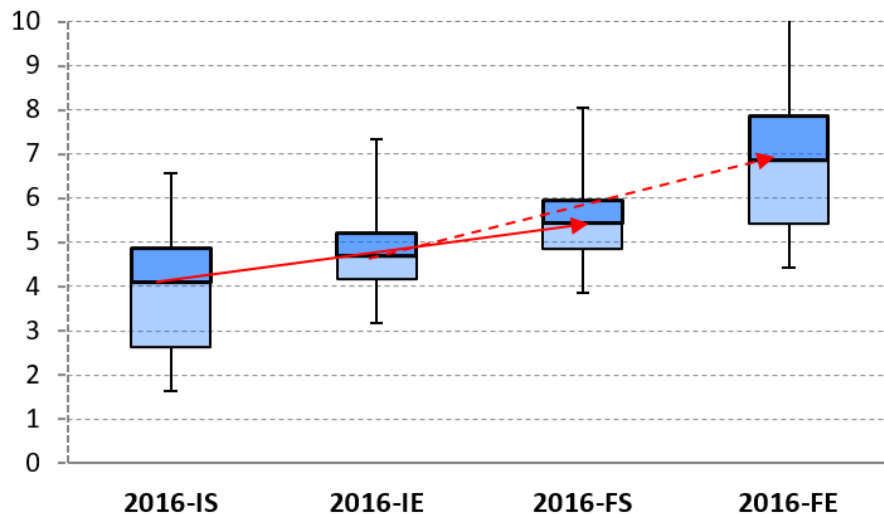


Figure 7. Technical Competences - Comparison

As for behavioral competences, Figure 8 shows that in the initial state, the exam has the lowest scores, where 50% of the group obtain between 1.6 and 4.8 points, less than 5 which is the least desired score; even the perspective that students had was greater than knowledge. By contrast, at the end of the course, 25% of students score between 8.6 and 9.3 on the exam, with a clear difference compared to 25% of students in self-assessments where they obtain scores between 6.8 and 8 points.

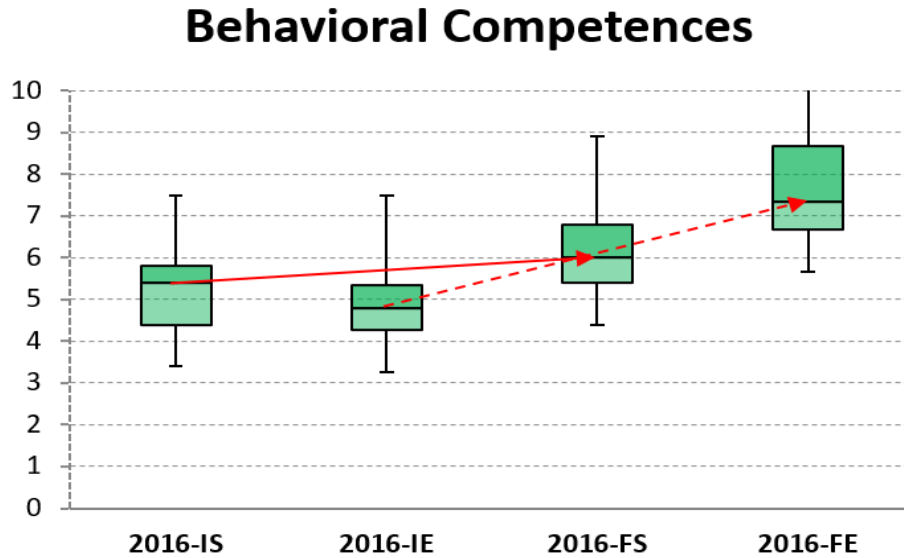


Figure 8. Behavioral Competences - Comparison

In the case of contextual competences, see Figure 9, as can be seen the mean increases at the end of the course in both self-assessments and exams. The students, when they self-assess in an initial state, they perceived that they did not have knowledge about this area, since 25% of the students scored between 0 and 1.8, the lowest in the present analysis.

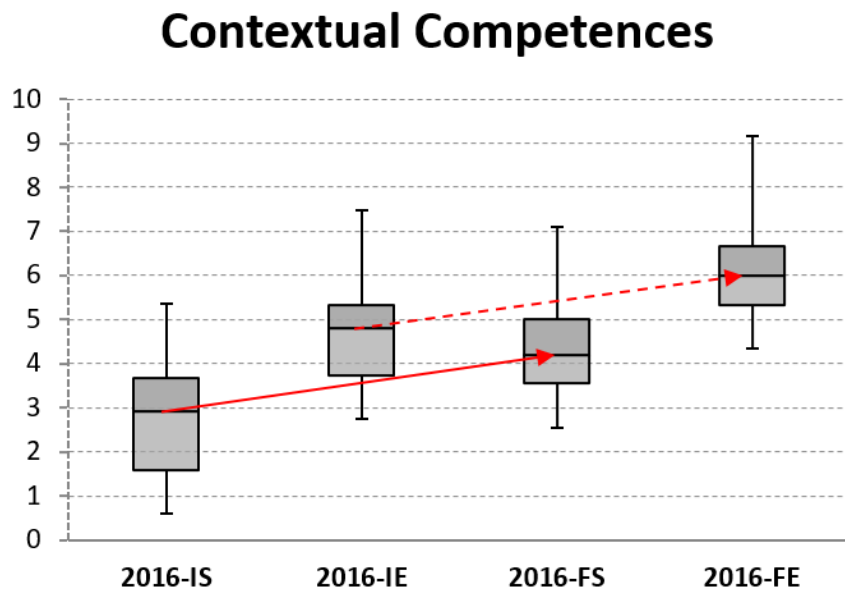


Figure 9. Contextual Competences - Comparison

To know the competences that are achieving a significant development perceived by the student the competences with significant development are compared in both self-assessments and exams.

In respect to the technical competences, there are 8 of them, which are all presented in [Table 6], since in self-assessments the student perceives the development in more competences, involving those developed in terms of knowledge.

As for competence 1.17 Information and documentation, it has been explained that within the course it is required what information and how to present it. In an initial state the students know what a report is, however, in the development of the project, they know in depth the formats required to present a project, the necessary regulations and the importance of the information in the project, which leads us to the second competence with greater development which is 1.10 Scope and Deliverables, since it is vitally important that the scope and deliverables are well defined in order to know what should be obtained from the project, what is included and

what is left out of it. Another competence linked to the development of this competence is the 1.03 Project requirements and objectives, which is the identification, definition and agreement of the project to meet the needs and expectations of the parties involved.

Element 1.11 Time and project phases, also has a significant development, which means that the student increases his ability to organize time and knows how to reflect it into a diagram in order to meet the objectives of it. When referring to time and scope, it is inevitable to mention about the quality of the project, which includes meeting the project's objectives and achieving its success. The students understand the need for quality as a tool for the satisfaction of the parties involved, which is another competence with greater development, and which is perceived by the student, being a new area of knowledge that has taken vital importance in recent years. It is necessary to know how to deal with all parties involved and interested in the project. The competence for project organization is also present, and indicates how the necessary work should be divided in order to meet the objective considering as well the tools needed.

As can be inferred, the competences presented are closely related, suggesting what the students develop the most in the course is knowing how to reproduce the project scope and what it involves to do it. Competence 1.19 Start-up is also presented and it relates to the end of the project.

As for the behavioral competences, only 5 are considered: Self-control, Open Attitude, Creativity, Efficiency and Consultation. These competences are necessary in a professional today, because he/she must have creativity to solve the constant problems and changes that society presents, maintaining an openness, that is to say be ready to listen to others and receive criticism or opinions from different levels, and therefore, maintaining the control of the situation and making the necessary consultations with the aim of exchanging opinions that contribute to the project. All this is included in the efficiency competence with which one must work to achieve the success of both the project and its management. The contextual competences, which are found in both analyzes with significant development are those obtained in the exams, since for the students all the competences of this area have significant development.

Figure 10 shows a detailed analysis by competences, comparing the initial and final state of the self-assessments with the exams.

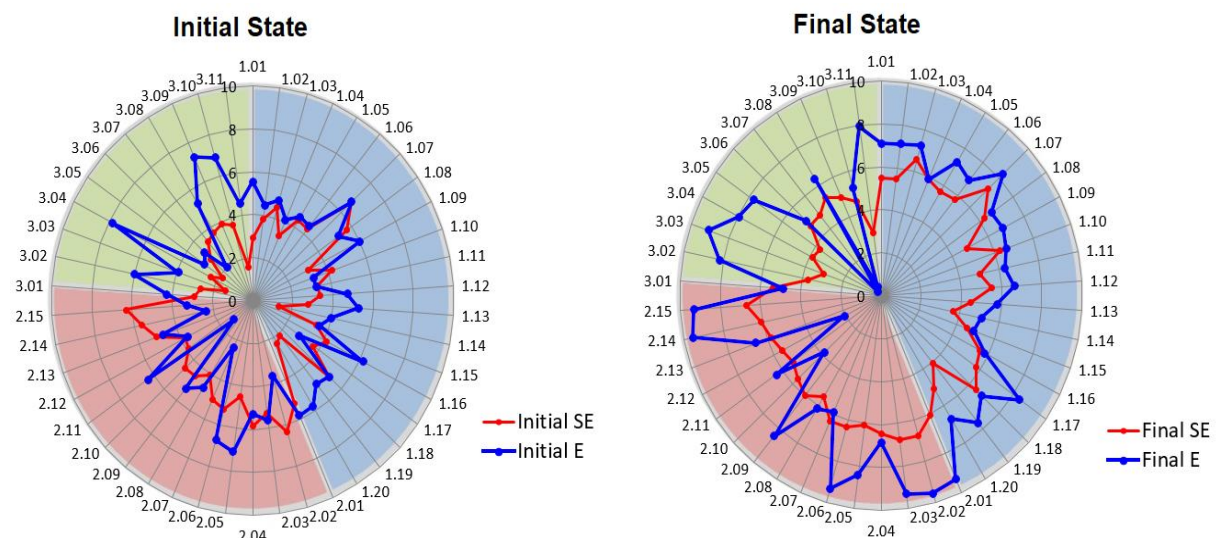


Figure 10. Comparison of competences: Self-Assessment and Exams in Initial and Final State

In an initial state it can be seen that in most of the competences the score obtained in the exam is higher than the one obtained in the self-assessment, being more evident in the contextual competences, however, the scores are low. Some of the competences where the student perceives that he/she has less knowledge about what is shown in the exam are: success in project management (1.01), project structures (1.09), Relaxation (2.05), Negotiation (2.11), Program Orientation (3.02), Portfolio Orientation (3.03). Nevertheless, there are also some competences where the student assesses his/her own work better, in the area of behavior; these are: Engagement (2.02), Creativity (2.07), Consultation (2.10), Values Appreciation (2.14) and Ethics (2.15).

In the final state, the difference is evident, since it is larger than the initial graph in behavioral and contextual competences.

CONCLUSIONS

In general, it has been demonstrated through statistical analysis that the competences in project management have been improved under the methodological structure proposed with the main focus on the PBL. This leads to the conclusion that this methodological structure helps the acquisition and development of competences, which can be replicated in other groups of students. Therefore, it is considered feasible to integrate the experience in other Engineering courses, reinforcing the professor's role as a tutor, defining the evaluation criteria according to the competences that the course wish to develop and identifying and evaluating the improvement of the competences during the learning process.

It was also shown that when students self-assess their competences, they judge themselves lower than the course professor. This could be attributed to the lack of maturity and the lack of professional experience that allows them to adequately assess their own abilities.

With respect to the development of competences, there is clearly the development of competences linked to the optimal management of the project scope, which is one of the pillars for the project success and one of the main course objectives. It is also concluded that there must be an appropriate interaction, a diversity that is provided by project-based learning.

The research also reveals that the methodological strategy fosters the student's research spirit and promotes the integration of the theoretical and practical elements, involving the student in a real project, developing competences helping to face situations and problems of daily life.

REFERENCES

- Bará, J. (2003). Aprendizaje basado en problemas/proyectos: ¿Qué, por qué, cómo? Institut de Ciències de l'Educació.
- Blank, W. (1997). Authentic instruction. En W. Blank, & S. Harwell, Promising practices for connecting high school to the real world (págs. 15–21). FL: University of South Florida.
- Cörvers, R., Wiek, A., De Kraker, J., Lang, D., & Martens, P. (2016). Problem-Based and Project-Based Learning for Sustainable Development. En H. Heinrichs, P. Martens, G. Michelsen, & A. Wiek, Sustainability Science. Springer.
- De los Ríos, I., Cazorla, A., Díaz-Puente, J., & Yagüe, J. (2010). Project-based learning in engineering higher education: two decades of teaching competences in real environments. *Procedia Social and Behavioral Sciences*, 1368–1378. doi:10.1016/j.sbspro.2010.03.202
- Dickinson, K., Soukamneuth, S., Yu, H., Kimball, M., D'Amico, R., & Perry, R. (1998). Providing educational services in the Summer Youth Employment and Training Program. DC: Department of Labor, Office of Policy & Research.
- Fernández, F., & Duarte, J. (2013). El Aprendizaje basado en Problemas como Estrategia para el Desarrollo de Competencias Específicas en Estudiantes de Ingeniería. *Formación Universitaria*, 6(5), 29-38. doi: 10.4067/S0718-50062013000500005
- Galeana, L. (2006). Aprendizaje basado en proyectos. CEUPROMED.
- Guerrero, D., & La Rosa, G. (2014). Experiencias del aprendizaje basado en proyectos en la enseñanza de la ingeniería industrial en el Perú. Twelfth LACCEI Latin American and Caribbean Conference for Engineering and Technology (LACCEI'2014). Guayaquil.
- Guerrero, D., De los Ríos, I., & Díaz-Puente, J. (2008). Las competencias profesionales: marco conceptual y modelos internacionales. *Jornadas Internacionales UPM sobre Innovación Educativa y Convergencia Europea 2008*. Madrid.
- Harwell, S. (1997). Project-based learning. En W. Blank, & S. Harwell, , Promising practices for connecting high school to the real world (págs. 23-28). FL: University of South Florida.
- IPMA. (2009). Nacional Competence Baseline. V3.0, Revisión. Valencia: Asociación Española de Ingeniería de Proyectos.
- Jenkins, H., & Lackey, L.W. (2005). Preparing Engineering Students for Working in. *IEEE International Professional Communication Conference Proceedings*.
- Jones, B., Rasmussen, C., & Moffitt, M. (1997). Real-life problem solving.: A collaborative approach to interdisciplinary learning. *American Psychological Association*.
- Katz, L., & Chard, S. (1989). Engaging children's minds: The project approach. Norwood, N.J.: Ablex.
- Lehmann, M., Christensen, P., Du, X., & Thrane, M. (2008). Problem-oriented and project-based learning (POPBL) as an innovative learning strategy for sustainable development in engineering education. *European Journal of Engineering Education* , 33, 283-295. doi:10.1080/03043790802088566

- Menéndez, J. (2003). Aprendizaje por proyectos: la experiencia en la Universidad de Castilla-La Mancha. Actas del I Encuentro Internacional de Enseñanza de la Ingeniería Civil. Universidad de Castilla-La Mancha. Universidad de Castilla la Mancha.
- PMI. (2008). Guía de los. Fundamentos de la. Dirección de Proyectos. Pennsylvania: Project Management Institute.
- Ramírez, M. (2009). La importancia del desarrollo de competencias del futuro ingeniero. 3er Foro Nacional de ciencias básicas: formación científica del ingeniero. México D.F: Universidad Nacional Autónoma de México.
- Thomas, J. (2000). A Review of Research on Project-Based Learning. California: The Autodesk Foundation.

An Instructional Design with Itunes U to Develop One-To-One Teaching Strategies in K12 Schools

Serhat GÜRGÜN

Educational Technology PhD Program

Bahçeşehir University

Istanbul, Turkey

gurguns@gmail.com

ABSTRACT

The tablet is one of the most important developments of the educational environments today. It is used at schools especially at private schools. The number of teacher and student using the tablet is rising day by day due to the development of digital instructional objects. Many approaches are being used in the schools and companies where tablets are used for education. LMS's which are introduced to the market and applications which can be reached from application stores are being used more effectively classrooms via web software.

The most important points that schools and teachers have to emphasize are:

- 1- How to run the strategies of education with the help of BYOD or tablets given to students.
- 2- To form 1:1 instructions for teaching with the help of tablets.

Modelling of education to be studied on is applied with functions like;

- Getting students involved before the lesson;
- Getting them taking part in the lessons in an efficient way;
- Make them a part of the process even when the lesson is over.

This instructional model has started at IELEV Schools with 310 students and 160 teachers during 2014/15 in Istanbul, Turkey and continuing with closely 1000 students now. In this study, the focus is on the model that has been in progress.

INTRODUCTION

The world is in a great advancement period within the field of technology in the 21st century. Every passed day, hour, minute and even second, a brand new technology appears on the stage. Technology usage has been inevitable for the people. The technological devices that we use everyday are being replaced by the advanced ones even if they are not old. The people are getting to find it difficult to keep step with the advancements. Scientists are all of one mind that the 21st century is going to be the era of knowledge. In the world, these fast advancements in technology also reflect on the education system and affect the actions in learning and teaching (İşman, 2005). The togetherness of education and technology causes them to affect each other. Instructional advancements increase the pace of technology. Especially by tablets, interactive boards and internet technologies, the schools becomes an educational technology valleys. These technologies can anytime forward any information to students easily anywhere on the earth. Today, the progress level of the countries and the effectiveness in the competitive market is being measured by the capacity of educated man resources. The nations of today and the future need individuals who are aware of how and what to learn, able to reach the true information and create solutions for them. For this reason, the individuals need devices that can bring them information and devices that can provide the use of the knowledge.

Interactive boards are efficient in compensating this need in instructional environments. In the new social structure, ISTE has defined the revised standards of basic information technologies and advised the institutions and the schools to develop the information and skills immediately (ISTE, 2017). Currently, the most up-to-date news about education is the use of technology in classrooms and teaching via tablets. Education and technology are the two basic factors playing an important role in humans' lives. Education is the act of uncovering inherent powers and talents of humans and developing them as more powerful, mature and creative beings (Yaylacı&Yaylacı, 1999). Technology, on the other hand, helps humans to profit from their earnings, e.g. knowledge and competences etc., more efficiently and apply them more consciously (Alkan, 2005). Regarding this, the rapid development of technology and emerging novelties are reflected in education systems and influence teaching and learning processes.

The problems making educators look for new ideas and approaches can be summarized as follows:

The inability

- to serve crowds simultaneously,
- to consider students' abilities and interests,
- to give necessary information efficiently in a short time (Kaya, 2002).

In today's world, economic, social and technological conditions shaping contemporary education systems are changing rapidly. As a result, the need to provide high-quality education to every individual emerges. Information and communication technologies serve very important functions in building a know-how society. In this way, attaining information and its transfer is getting faster and easier. The most important matter in this topic is to choose the right and applicable teaching model.

SUBJECT OF THE TASK

According to the specialists, tablets and applications which made by interactive tools will affect education sector in a good way. The ability of the individuals to learn efficiently and interactively without depending on time brings us the idea that educational technology era is going to affect education sector in a good way. The basic subject of this study tablets makes the learning and teaching easier and faster if we use it efficiently. Because they are just tools. Main component is still teacher in education. The efficiently way of using the tablet that believing it is useful and we should try to create interactive instructional applications. The real problem in educational institutions is how to run a teaching model in one-to-one learning projects of tablets. Many institutions have problems in how to get teachers and students become involved efficiently during the process. Studies, which have to be shaped in classes or out of the classes, take time (Gürgün, 2015). Being a part of Project-based teaching has to be taken into consideration in a different way. It is important how to use the educational technologies at the right time. Therefore, a new digital teaching model has been studied via taking different models into consideration. The question is: How can one-to-one teaching be possible with the help of tablets?

THE AIM AND THE IMPORTANCE OF THE STUDY

The changing and developing technological restructurings not only provide expansive and common solutions to develop, but also they cause the educational quality to be evaluated in the international standards and the expectations from the individuals to increase highly. Increasing the quality of education and expanding the educational facilities are argued out primarily in every international platform on each continent. The national based expectations and projects have started to expand to international criterions in order to accord with transformations of hardwares and softwares, gaining new experiences and new skills, learning a language, accessing to international information in problem solving and facilities to use them, expansions to new cultures (Erbarut, 2003).

The new communication technologies have the power and facilities to make radical changes in the educational communication processes that have lost the up to dateness. Apart from that, the assessment roll technologies can create significant changes in the management and application procedures of the educational communication systems (Demiray, 1995).

The advancements in the technology contribute to the self-development of the individuals by enabling them to be aware of the happenings on the earth. As there is an information pool, the individuals expect much from their educators and with the help of these developments; the educators also have to update themselves. (Ülgen & Acar, 224). By the courtesy of technological developments, the structure of the educational system, learning and teaching environments and the experiments carried out varies. We observe that, the new generation children nearby are endeavoring to learn something and apply with the effect of developing technology and the consciousness of the millennium era we are now in. This situation requires new ways to be found in order to make the education more quality and to make the student more learner. Using tablet is one of the most preferred way for this search.

To use tablet effectively, first we need to detect problems about availability. This approach is important for usage, improving and generalizing of this educational technology (Üstün, Şılbır, Kurşun & Gökteş, 2013). Especially grewed and growing countries' governments such as UK, USA, South Africa and Australia allocated a huge amount of state funding to education sector for purchasing interactive technologies. For example the results of a research has been made at all primary schools and 98 percent of secondary schools in UK in 2007 were obtained that whole classrooms have interactive technologies (Lai, 2010, Bulut & Koçoğlu, 2013). The main aim of this study is to administer the process of the one-to-one teaching to be able to keep it effective and constant. The developed teaching model is focused on which material is important, where to teach and what sources we need to use. This method can be effective in the process that has come forward by the help of Nano teaching if it is used with the right school materials, the students and teachers. The e-teaching process will be one of the most important thing that if we use the technology in the right place and at the right time. The most important thing that we must not forget that using the educational technology is different from the technology which is used in education. It doesn't mean that to buy the equipment that is related to technology or to bring the computer into the classroom. It requires a lot more academic work. So, multifunctional interactive teaching method has helped to develop the process that has changed to educational technology from the technology in education.

ONE-TO-ONE MULTIFUNCTIONAL INTERACTIVE INSTRUCTIONAL METHOD, EDUCATION VIA TABLETS

"Multifunctional Interactive Instructional Method" has been created and developed by Serhat Gürgün was improved by taking pedagogical, cognitive, academical and technical feasibility and 5E learning modals by SAMR into account. The modal we discuss is a teaching modal which handles the features of getting attention, conceiving, applying and improving, measuring and evaluating, creativity, configuring, blended learning and flipped classrooms via iTunes U to the subject and acquisition dimension with different functions which are different strategies oriented. During the lead of teaching modal, teaching applications which strategies are in harmony with, digital teaching objects which are enriched and web based applications are presented to use. This teaching modal which is improved, is handled as an approach which actively handles 1:1 tablet-oriented teaching learning facilities and which provides participation interactively in the lesson in the frame of constructivist approach of students by measuring learning products during the process. There are 5 different functions which consist of 6 strategic steps and the relation among those steps in the modal concept. Teachers are expected to manage these teaching-learning processes by using these functions.

Functions can be chosen according to lesson, subject and acquisition. The suitable functions which are stated according to the planned lesson process can be used. *Entire function* where all strategic steps take place shows the highest level teaching facilities. The aim is to use the entire function effectively to manage teaching facilities efficiently. Function selection during the lesson and out of the class comes from being able to place to both activities and theoretical expression. In the name of being able to be used for entire function, it will be beneficial for the departments to shape their study for the purposes of modal action. Strategic steps and functions in the extent of modal are defined with their explanations below.

STRATEGIC STEPS

A: Handing out introduction parts of the topic to the students in advance:

Flipped Classroom application is performed here. That is, teacher gives information about the important parts for the students via related education applications or ready digital teaching objects (textbook, presentation, video, sound) before the work on the wide subject which is aimed to be taught. Teacher asks students to observe the related parts. The videos are short on this application and entire subject presentation is not done. The aim is to encourage students to come to the class well prepared about the subject and make the class ready to learn at some point. Time at lesson, subject and acquisition pace and explanation method can be differentiated according to the departments. For instance, for Maths lesson, the formulation of a problem and basic concepts can be emphasized but not the solution of a problem. For Social Science lesson, spark events about why The First World War began can be highlighted. For Physical Education lesson, basketball rules can be told as preliminary information.

B: Online measurement of students being ready before lesson, forming a web based discussion atmosphere

This step is used with the step A. By following the step A, to identify the learning level of information, a test/quiz prepared with online test/form applications (which may include optional, open ended, questions to mark, etc.) and/or a discussion on a web based platform are applied. As teacher will receive that report at that time, this will help teacher about how to start with that subject.

C: Evaluation and application through activities in class:

Nearpod or similar apps, which enable the teacher to enrich a topic's important sections and activities, are covered in a teaching-learning activity. This presentation allows the teacher to only use the necessary bits according to the lesson plan. Throughout the implementation, students manage their own learning environment by using interactive activities in the lesson.

D: Teaching a topic with whiteboard applications, lesson presentations with presentation tools, shared implementation with apps:

Whiteboard Applications in the lesson are used throughout. Topics are covered on the whiteboard with applications such as Explain Everything and the lesson recorded can be shared with students. The lesson is done through presentations prepared by the teacher on apps such as Explain Everything, Keynote etc. The teacher asks students cover tasks individually or in groups with iWork and Google Apps.

E: Online test applications and test/quiz classroom applications at the end of lessons and topics: Test/quiz prepared with Google form etc. are applied in the classroom by planning the numbers of questions according to the condition of the subject at the end of lesson and acquisition. Thanks to this application, it is identified at what level the subject at the end of the subject, information given about what is taught is understood. In order not to make students experience the exam excitement, some gamification applications like Kahoot is used to make the application enjoyable at the end of subject.

F: Online Homework and Projects to assign, collect, give feedback and evaluate:

The aim on this step which is highly recommended to be used for all functions, especially at the end of the subject is to get evaluation of teaching process in force. The important point which is necessary not to confuse with E step is that F step includes a wide assessment and evaluation. It is discussed to send students and collect by forming large-scale tests, debates or projects by taking the advantage of feedback on the step E. Homework given up it's seat to great projects on this step which takes place of homework given in classical teaching.

Functions (from easy to complicated functions):

Each function is formed by companying the strategic steps with each other. Letters state the strategic steps. The letters following each other states related strategic steps in order (Figure 1).

Fn1: CDE (CE and DE sub-functions can be used separately)

Fn2: ABCE

Fn3: ABDE

Fn4: ABCDE

Fn5: ABCDEF (Entire function)

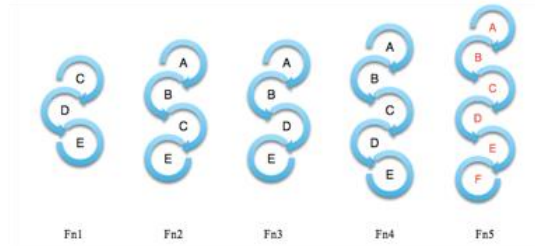


Figure 1. Functions

iTunes U > İELEV Eğitim Kurumları



Abone Ol

İELEV Eğitim Kurumları
Kategori: Müfredat ve Eğitim
Dil: Türkçe
1 Nis 2015 Tarihinde Yayımlandı
Bu ders, iOS için iTunes U uygulamasıyla
görüntülendiğinde öğrenen notları ve
ödevler gibi gelişmiş materyaller de
içerebilir.

Atatürk'ü Anlamak

İELEV Eğitim Kurumları

Ayrıntılar Oyalar ve Yorumlar Benzer

Tanım

Ünitemizin bu konusunda Atatürk inkılabının öncesi ve sonrası karşılaştıracağız. Ardından Atatürk'ün öncülük ettiği inkılaplar ile Atatürk ilkelerini öğleştireceğiz.

Ders Taslağı

- I. Atatürk'ü Anlamak
 - a. Nearpod Uygulaması
 - b. Atatürk İlkelerinin Özellikleri Konulu Keynote Sunumu
 - c. Kazanım Değerlendirme Çalışması
 - d. Atatürk İlike ve İnkılapları Konu Değerlendirmesi "Kahoot"
- II. Atatürk'ü Anlamak Konulu Etkinlikler
 - a. Google Form Etkinliği
 - b. Pages Uygulaması ile Poster Çalışması

Figure 2. iTunes U Public Page

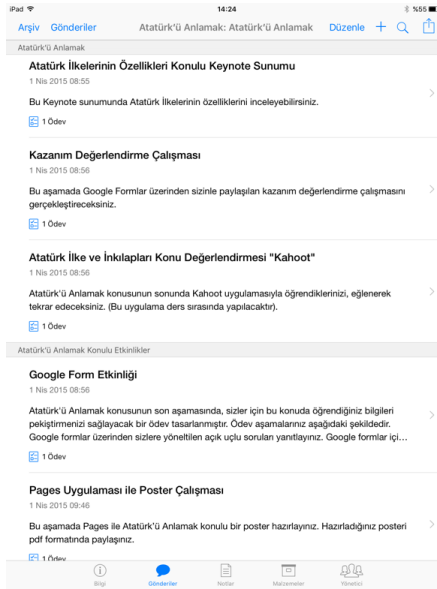


Figure 3. iTunes U Course Content

CONCLUSION

For one-to-one learning with tablets can be successful if we understand the main objectives. The teachers' role of this method should be explained so clearly. Teachers training is also so important to accomplish this process. The applications which are recommended to use on strategic steps are the applications in which all necessary research and study are done, tested and found suitable for efficient teaching-learning atmosphere. The applications which can be used suitable for the aim can be used separately.

Explain Everything: Board in the classroom, presentation and projection preparation out of the classroom <http://www.explaineverything.com>

Textbook: Interactive coursebooks prepared with iBooks Author. <http://www.apple.com/ibooks-author>

Nearpod: A lesson management classroom application <http://www.nearpod.com>

Google Apps: Google education applications. <http://www.google.com/edu/apps>

Kahoot: A game - based learning platform. <http://getkahoot.com>

iWork Apps: Apple applications. <http://www.apple.com/iwork>

Important points to take into consideration

- F step can be used for each function; but it should precisely be applied at the end of the lesson.
- E step should be applied for each function.
- If A step is applied, B step should exactly be applied.

REFERENCES

- Alkan, C. (2005). *Eğitim Teknolojisi*. Ankara, Anı Publishing, 7th edition.
- Demiray, U. (1995). İlkeleri, İşleyişleri ve Örnekleriyle Dünyada Açıköğretim. Eskişehir, Turkuaz Publishing, First edition.
- Erbarut, E. (2003). Web Temelli Eğitim ve Öğrenme-Bilişim Teknolojileri. *TMMOB Journal of Electric Engineering*, V: 41, No: 419. Ankara.
- Gürgün, S. (2015). Multifunctional Interactive Instructional Method for 1:1 Digital Learning Initiatives: Gürgün's Method. *Journal of Modern Education Review*, V: 5, No. 12, pp. 1142–1146, Newyork.
- ISTE (International Society For Technology In Education), (2017). ISTE Standards for Educators. <http://www.iste.org/standards/standards/for-educators>
- İşman, A. (2005). Uzaktan Eğitim. Ankara, Pegem A Publishing, Second edition.
- Kaya, Z. (2002). Uzaktan Eğitim, Ankara: Pegem Publishing.
- Lai, H. J. (2010). Secondary School Teachers' Perceptions of Interactive Whiteboard Training Workshops: A Case Study From Taiwan. *Australasian Journal of Educational Technology*. 26 (Special issue, 4), 511-522, <https://ajet.org.au/index.php/AJET/article/view/1069>
- Ülgen, A. & Gökhan A. A. (2004). Bilişim Teknolojilerinin Öğrenmedeki Yeri. *4th International Educational Technology Conference*, Sakarya, 24-26 November 2004.
- Üstün, A. G., Şılbr, L. Kurşun, E. & Göktaş, Y. (2013). Etkileşimli Tahtaların Ders İçeriğinin Sunumu Sırasındaki Kullanılabilirliği. *The Journal of Instructional Technologies & Teacher Education*. 1, No:3, 42-53, <http://www.jitte.org/ojs/index.php/jitte/issue/view/3/showToc>
- Yaylacı, H.S & Yaylacı, F. (1999). Eğitim Teknolojisi Dersinde Öğretim Materyallerinin Geliştirilmesi, *Afyon Kocatepe University Journal of Social Science*, V: 3, pp: 209-219.

An Investigation on the Acceptance of Mobile Learning (M-Learning) Among University Students in Hong Kong

Hon Keung YAU

Department of Systems Engineering and Engineering Management

City University of Hong Kong

Hong Kong

honkyau@cityu.edu.hk

Man Chung LEUNG

Department of Systems Engineering and Engineering Management

City University of Hong Kong

Hong Kong

mcleung26@gmail.com

Hong Yin CHUNG

Department of Systems Engineering and Engineering Management

City University of Hong Kong

Hong Kong

hongchung3-c@my.cityu.edu.hk

ABSTRACT

Mobile learning is considered as a learning process conducted by mobile devices. The term “mobile” is refer to execute certain process any place, any time using portable equipment such as wireless laptops, Personal Digital Assistants (PDAs) or smart phones. Due to the rapid development of technology, mobile learning is becoming more important as almost every student has his/her own mobile device. It seems that using mobile devices for learning is gradually replacing the traditional method like using textbooks, hand-written notes, etc. According to Hahn (2008), people can access network information anytime, anywhere with the usage of mobile wireless devices in mobile wireless network. Based on the flexibility of using the mobile devices, mobile learning is not limited to certain areas, people can perform it wherever they like, and it encourages people to be more motivated to learn more. The purpose of this investigation is to analyze the acceptance of mobile learning among university students in Hong Kong and identify factors which might influence the intention to accept m-learning. Two models were involved in this project, which were the Technology Acceptance Model 2 (TAM2) proposed by Venkatesh &

Davis (2000) and the UTAUT model proposed by Venkatesh et. al. (2003). The finalized conceptual model has seven constructs and eleven hypotheses, hypotheses are the relationship between different constructs. Questionnaires were distributed to students from different universities. At the end, the intention of using mobile devices for learning among university students in Hong Kong has been studied through the result of the questionnaires collected. The result shows that a model consists of seven components which could be used to explain the topic issue. Relevance and Effort Expectancy are two critical constructs. Besides, there are eleven valid relationship established, identifying the relationship between different components.

INTRODUCTION

For the traditional learning mode, materials like textbooks and written notes are regarded as the most common and important learning tools for students, using mobile devices as a learning tool seems unfamiliar with them, especially for students in Hong Kong. According to Bakia, Mitchell, & Yang. (2007), the concept of mobile learning has been around for years, the design and creation of mobile devices and its application have improved a lot, especially in recent years. The Information Technology (IT) has already been incorporated into the learning process, with the purpose of supporting and assisting students in the learning process. (Gutiérrez, Trenas, Ramos, Corbera, & Romero, 2010). The word ICT (information and communication technologies) refers to technologies which provide us to access information via telecommunications, mainly focus on communication technologies. The above-mentioned ICT has had an important impact on the way we learn and teach (Eristi, & Haseski, & Uluuysal, & Karakoyun, 2011; Martin et al., 2011; Suki & Suki, 2011). Besides, different types of advanced modern technologies and devices such as mobile devices have been introduced in education. (El-Gayar, & Moran, & Hawkes, 2011; Eristi et. al, 2011; Williams & Pence, 2011) In addition to this, with the rapid development of modern science and technology, mobile devices is not just a simple device which can only present a single function. Diverse kind of mobile devices like PDA, smartphone or notebook are actually offering more and more functions to users. From the perspective of user, it is convenient to access the internet and get the information they need by just clicking a simple button directly on the mobile devices. Actually, when compared with the old-fashioned learning method, the advantages of using mobile devices for learning are obvious and dominant. Ubiquitous access to internet enable user to access the internet on different platforms to extend its flexibility. According to Sharples, M., & Sanchez, A., & Milrad, M., & Vavoula, G. (2008), mobile learning does not require fixed place or area, instead, it can be finished across locations. Also, Ozdemir (2010) mentioned that mobile devices are technologies that we can approach whenever and wherever we are. Thus, mobile learning is closely related to students, it is a new trend and it is worth to be a research topic.

Areas covered in this project are:

1. Do personal characteristic, for example, gender difference, have impact on university students' intention to use mobile devices for learning?
2. What is the relationship between different variables in the research model?
3. Are the hypotheses involved in this investigation substantiated?

THE STUDY**Mobile devices**

According to Valk, Rashid, & Elder (2010) and Keegan (2005), mobile devices refers to technologies that are transportable and included in mobile computing devices, just like smartphones, tablet computers or netbooks. Nowadays, mobile devices were not just focusing on telephone calls or text messages, but also focus on different purposes (Dewitt & Siraj, 2011). Aldhaban (2012) stated that the number of research on the importance of mobile devices has raised sufficiently. Roschelle, Sharples, & Chan (2005) stated that “the devices are becoming part of the day-to-day wardrobe for students everywhere” (p.159-161). So, mobile devices are everywhere, becoming a part of our daily life, especially for students. With so many mobile devices available for students, they can have opportunity to create their own mobile learning environment to enhance the learning effectiveness and performance.

Mobile Learning

Actually, mobile learning is not totally as same as e-learning, mobile learning is a characterized technology and has its own terminology. Normally, we simply regard mobile learning as a learning process with the use of mobile devices. A general definition of mobile learning are defined as a learning process, which is facilitated by mobile devices (Herrington & Herrington, 2007; Valk, J. et al., 2010) or “a process of learning through the use of mobile devices and wireless transmission” (Peng, Chou, & Tsai, 2009, p.171-183). Besides, mobile learning is a new form revealed in the 90s. (Wains, & Mahmood, 2008). Mottiwalla (2007) stated that mobile learning refers to an individualized learning process which is no time and geographical limitation. Jairak, Praneetpolgrang & Mekhabunchakij (2009) also found the following:

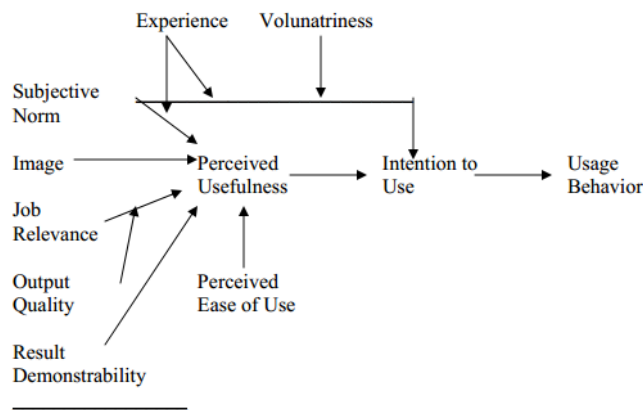
The delivery of electronic learning materials to mobile devices that in currently exploits both handheld computer such as laptop PCs in small size, tablet PCs and mobile phone such as mobile phone, smart phones,

Personal Digital Assistants (PDAs), Pocket PCs including the learning that can happen anywhere and at any time. (p.36.3)

Development of the research model

Background

In this project, the conceptual model used is a combination of two models, the Technology Acceptance Model (TAM2) and the Unified Theory of Acceptance and Use of Technology Model (UTAUT model). Venkatesh and Davis (2000) extend the original TAM in 2000, named “TAM2”. They developed several extension, perceived usefulness is in terms of two processes, the first one is “cognitive instrumental processes”, including job relevance, output quality, result demonstrability, and perceived ease of use. The second one is “social influence processes”, including subjective norm, voluntariness, and image. They call the new generation of TAM as “TAM2”. A diagram of TAM2 is presented in [Figure 1].



Adopted from Venkatesh and Davis (2000)

Figure 1: The Technology Acceptance Model, version 2. (Venkatesh & Davis 2000)

On the other hand, the UTAUT model is also considered. The UTAUT [Figure 2] proposed by Venkatesh et al., in 2003, is one of the models used to account for the user acceptance of a new technology. Since empirical results of the UTAUT model revealed that it was able to account for 70% of variance in usage intention (Venkatesh et al., 2003; Shaper & Pervan, 2007), so, it is obvious that UTAUT is a robust model.

The UTAUT model

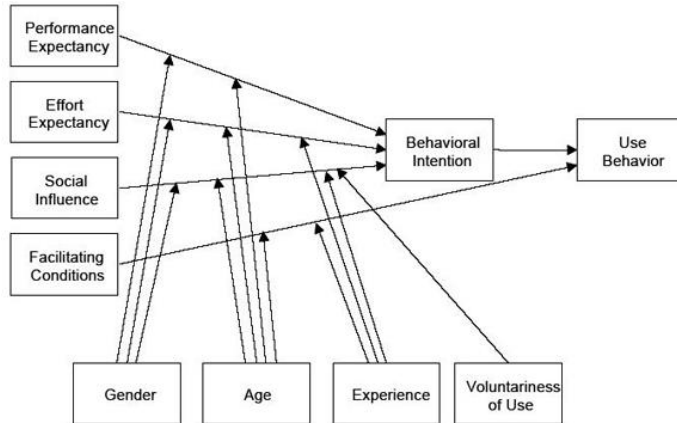


Figure 2: The Unified Theory of Acceptance and Use of Technology Model, (Venkatesh, Morris, Davis, and Davis 2003)

Based on the previous references, since perceived usefulness and perceived ease of use can be regarded as performance expectancy and effort expectancy, so, it is suitable to combine two models and link the variables together, to form a new, robust, reliable model.

Conceptual model

The research model in this project

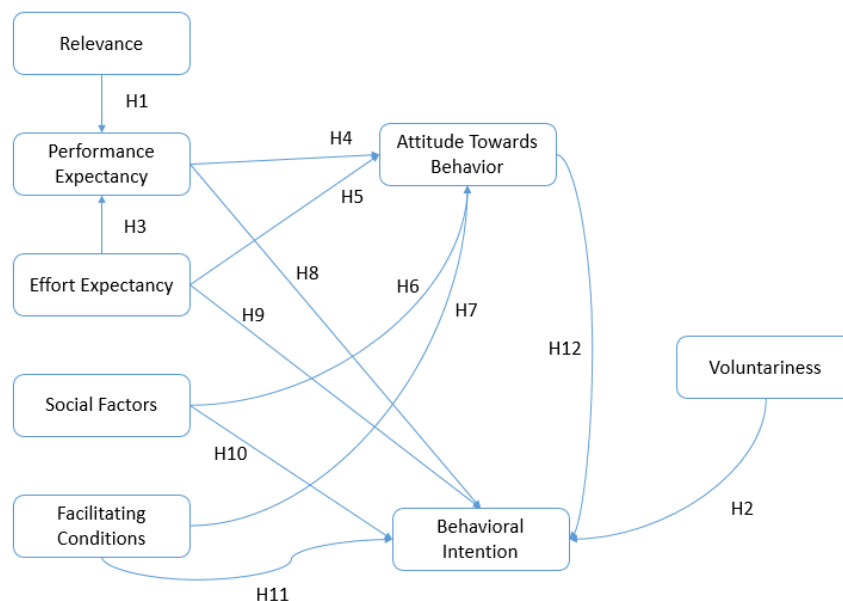


Figure 3: The Conceptual Model

The proposed conceptual model is shown in [Figure 3].

DEVELOPMENT OF HYPOTHESES

The relationship between Relevance and Performance Expectancy

Venkatesh and Davis (2000) defined job relevance as “an individual’s perception regarding the degree to which the target system is applicable to his or her job” (p.191). TAM2 posits that job relevance has a positive effect on perceived usefulness. Besides, Hong et al. (2006) argued that perception of job relevance has a positive effect on perceived technology usefulness. Therefore, we hypothesize:

H1: There is a positive effect of Relevance to the Performance Expectancy

The relationship between Voluntariness and Behavioral Intention

Venkatesh and Davis (2000) mentioned that when a usage is considered as voluntary, the influence of others will decrease since the experience is increased. Besides, According to the study conducted by Sun and Zhang (2006), it is found that voluntariness is a variable which can help shape the behavioral intention to accept a technology. Venkatesh et al. (2003) conducted a study comprised of voluntariness and experience as variables and found that the explanatory power of the TAM increased from 35% to 53%. So, we hypothesize:

H2: There is a positive influence of Voluntary to the Behavioral Intention.

The relationship between Performance Expectancy and Effort Expectancy

Several studies conducted have confirmed that perceived ease of use of a technology has an effect on the perceived usefulness. (Liaw & Huang, 2003; Shang, Chen, & Shen, 2005). According to King & He (2006a), it stated that perceived ease of use is a predictor of perceived usefulness which is already proved by many studies. Several researchers mentioned that when all other factors are equal, users likely consider a technology useful when they believe it is easy to use. (Bruner & Kumar, 2005; Hu et al., 1999; Igbaria & Iivari, 1995). Besides, Adams, Nelson & Todd (1992) and Davis (1989) mentioned that perceived ease of use has a direct influence on the perceived usefulness. Thus, the following hypothesis have been proposed:

H3: There is a positive influence on Effort Expectancy to the Performance Expectancy

The effect of Performance Expectancy and Effort Expectancy on Attitude towards Behavior

The Technology Acceptance Model (TAM) proposed by Davis (1989) clearly pointed out that perceived usefulness and perceived ease of use are the two beliefs about using a technology. Research indicated that the attitude towards behavior was influenced by both Performance Expectancy and Effort Expectancy. (Childers et al., 2001; Dabholkar & Bagozzi, 2002; Davis, 1989; Mathieson, 1991). Thus, we hypothesize that both P.E. and E.E.

has positive effect on technology acceptance via the variable attitude towards behavior:

H4: Performance Expectancy has a positive relationship with Attitude towards Behavior

H5: Effort Expectancy has a positive relationship with Attitude towards Behavior.

The relationship between Social Factors and Attitude towards Behavior

Based on the TAM2 proposed by Venkatesh & Davis (2000), it pointed that social influences have a direct effect on the intention to use. Besides, some researchers had supported this relationship. For instance, Lucas and Spittler (1999) claimed that “organizational variables such as social norms and the nature of the job are more important in predicting the use of technology than are users’ perceptions of the technology” (p. 304). Schepers, J. & Wetzels (2007) also find that social norms are important in influencing users’ attitude towards use. Hence, we hypothesize:

H6: Social Factors has a positive relationship with Attitude towards Behavior

The relationship between Facilitating Conditions and Attitude towards Behavior

According to Teo (2011), it indicated that facilitating conditions were found to have a positive effect on the attitude towards computer use, in this case, it refers to the attitude towards the acceptance of mobile learning. Besides, several studies have found that technical support is one of the important factors in the acceptance of technology, user satisfaction and in promoting more positive attitudes towards computer use. (Igbaria, 1995; Williams et al., 2011). So, the following hypothesis has been suggested:

H7: Facilitating Conditions has a positive relationship with Attitude towards Behavior.

The effect of Performance Expectancy and Effort Expectancy on Behavioral Intention

According to Macharia (2010), there are TAM research postulated that if people think that the technology is useful, they will have positive and encouraging behavioral intention. Further, Davis (1989) and Venkatesh & Bala (2008) pointed out that perceived usefulness has a positive influence on behavioral intention. According to Taylor & Todd (1995) and Venkatesh & Davis (2000), performance expectancy is the strongest component to predict the intention of a user behavior in either mandatory or voluntary context. Also, it is proved that perceived usefulness and perceived ease of use are the main factors which can influence an individual’s intention to use a system. (Ma & Liu, 2004; Schepers & Wetzels, 2006). Moreover, there are also some evidence to reflect that behavioral intention is influenced by perceived usefulness. (Adams et al., 1992; Davis et al., 1992; Hu et al., 1999; Venkatesh & Davis, 2000). Venkatesh et al. (2003) stated that constructs related to effort expectancy are important in early stages of the introduced behavior. So, two hypotheses have been proposed:

H8: There is a positive influence of Performance Expectancy to the Behavioral Intention.

H9: There is a positive influence of Effort Expectancy to the Behavioral Intention

The relationship between Social Factors, Facilitating Conditions and Behavioral Intention

Jairak et al. (2009) mentioned that facilitating condition have an impact on behavioral intention. Foon and Fah (2011) conducted a study about the adoption of e-banking in Malaysia, and the result showed that facilitating conditions significantly impact the behavioral intention to use. Besides, Alrawashdeh, Muhairat, & Alqatawnah (2012) also pointed that social influence and facilitating conditions are factors that affect the behavior intention of a user. Besides, Yamin, & Lee, (2010) found that there is an important relationship between social influence and behavioral intention. So, two hypotheses have been proposed:

H10: There is a positive influence of Social Factors (S.F.) to the Behavioral Intention.

H11: There is a positive influence of Facilitating Conditions to the Behavioral Intention.

The relationship between Attitude towards Behavior and Behavioral Intention

In the TAM, it is proved by many research that behavioral intention is affected by attitude towards behavior. Also, Bagozzi, Baumgartner, & Yi, (1992) stated that attitude means a feeling, either comfortable or uncomfortable, on a particular behavior. Moreover, Jairak et al (2009), Ndubisi (2006) & Teo (2011) indicated that attitude towards behavior had a vital impact on the intention to use education technology. Ndubisi (2006) claimed that the “attitude towards behavior” has a direct effect on the behavioral intention, and its variance was similar to variance of perceived usefulness and perceived ease of use. The previous finding by Ndubisi was further supported and strengthen by Jairak et al. (2009). So, we hypothesize:

H12: Attitude towards Behavior has a positive effect on Behavior Intention.

Comparison of students' Performance Expectancy between Genders

According to Tannen (1990) & Coates (1986), men and women have different pattern of oral communication. Men focus on social hierarchy and competition while women focus on a networking approach, using discourse to achieve intimacy, support and cooperative behavior. It means that women tend to let all participants speak and men tend to use discourse to build a hierarchy of domination. As Coates (1986) concluded, these difference should apply to electronic media as well. Zack (1993) suggested that context is a crucial factor, when communicating with others by using email, there will be more interactive exchanges and context building exchanges of women than men because women tend to use communication for rapport and cooperative behavior whereas men tend to focus on content. The fit between discourse pattern and media characteristics would affect the way a person perceive

media effectiveness. Moreover, according to Davis (1986, 1989), increase media effectiveness is equal to increase in perceived usefulness.

RESEARCH METHODOLOGY

In this study, a questionnaire survey has been conducted to gather data from different students. Useful data on the questionnaires are regarded as important information and those kind of information will be processed and generated a variety of charts and tables. There are totally eight variables in the research model and each variable is tested by multiple questions in the questionnaire. When the necessary information are collected, the validity of each variable and the relationship among different variables can be tested.

Multiple articles were considered, the questions in the questionnaire were extracted from these articles. For instance, some questions are extracted from the article “An Acceptance of Mobile Learning for Higher Education Students in Thailand” written by Kallaya Jairak, & Prasong Praneetpolgrang, & Kittima Mekhabunchakij (2009), since this article is related to the acceptance of mobile learning, so, this article can provide vital information to design a questionnaire. All of the questions extracted from different questionnaires were modified to generate the questionnaire used in this survey. The questionnaire was divided into five parts and consists of totally 40 questions. For the questionnaire, the Likert scale has been adopted, it is a widely used approach to scale response in survey. There are totally five level Likert items, in this questionnaire, “1” represents “Strongly Disagree”, “2” represents “Disagree”, “3” represents “Neither agree nor disagree”, or “Neutral”, “4” represents “Agree” and finally, “5” represents “Strongly Agree”.

Totally, 200 questionnaires were distributed and 150 were returned. Therefore, the response rate is:

= collected samples / total numbers of questionnaires distributed

= $150/200 \times 100\%$

= 75%

Factor Analysis

Communalities

	Initial	Extraction
SN_1	1.000	.722
SN_2	1.000	.645
SN_3	1.000	.587
REV_1	1.000	.757
REV_2	1.000	.780
REV_3	1.000	.784
VOL_1	1.000	.656
VOL_2	1.000	.710
VOL_3	1.000	.682
PU_1	1.000	.750
PU_2	1.000	.758
PU_3	1.000	.755
PEOU_1	1.000	.682
PEOU_2	1.000	.569
PEOU_3	1.000	.659
SF_1	1.000	.720
SF_2	1.000	.704
SF_3	1.000	.647
SF_4	1.000	.710
FC_1	1.000	.637
FC_2	1.000	.590
FC_3	1.000	.686
FC_4	1.000	.591
AT_1	1.000	.723
AT_2	1.000	.721
AT_3	1.000	.715
AT_4	1.000	.742
BI_1	1.000	.674

BI_2	1.000	.703
------	-------	------

Table 1: Factor Loading of the Measurement Scale

As mentioned in the data analysis part, Fornell & Larcker (1981) suggested that the acceptable value of factor loading and the corrected item-total correlation was 0.3. From the above factor loading [table 1], it showed that the value of factor loading of all of the items in the questionnaire were greater than 0.3, so, this scale was reliable.

Reliability Analysis

The value of the Cronbach's Alpha for the attribute "Relevance" was 0.882.

The value of the Cronbach's Alpha for the attribute "Voluntariness" was 0.694.

The value of the Cronbach's Alpha for the attribute "Performance Expectancy" was 0.887.

The value of the Cronbach's Alpha for the attribute "Effort Expectancy" was 0.728.

The value of the Cronbach's Alpha for the attribute "Social Factors" was 0.775.

The value of the Cronbach's Alpha for the attribute "Facilitating Conditions" was 0.692.

The value of the Cronbach's Alpha for the attribute "Attitude towards Behavior" was 0.866.

The value of the Cronbach's Alpha for the attribute "Behavioral Intention" was 0.805.

The Cronbach's Alpha of all variables were closer/greater than 0.7 (Nunnally, 1978). So, the scale was reliable.

ANALYSIS OF RESULT & DISCUSSION

Demographic Information of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender					
Valid	Male	89	59.3	59.3	59.3
	Female	61	40.7	40.7	100
	Total	150	100	100	
Age					
Valid	18-20	62	41.3	41.3	41.3
	21-23	71	47.3	47.3	88.7
	24-26	9	6	6	94.7
	27-30	3	2	2	96.7
	>30	5	3.3	3.3	100

	Total	150	100	100	
University					
Valid	City University of Hong Kong	140	93.3	93.3	93.3
	The Hong Kong Polytechnic University	3	2	2	95.3
	Hong Kong Shue Yan University	1	0.7	0.7	96
	The University of Hong Kong	4	2.7	2.7	98.7
	The Chinese University of Hong Kong	1	0.7	0.7	99.3
	Others	1	0.7	0.7	100
	Total	150	100	100	
Year of Study					
Valid	Year 1	4	2.7	2.7	2.7
	Year 2	84	56	56	58.7
	Year 3	40	26.7	26.7	85.3
	Year 4 or above	2	1.3	1.3	86.7
	Postgraduate	20	13.3	13.3	100
	Total	150	100	100	
Using mobile devices					
Valid	Yes	147	98	98	98
	No	3	2	2	100
	Total	150	100	100	
Using mobile devices for internet connection					
Valid	Yes	147	98	98	98
	No	3	2	2	100
	Total	150	100	100	
The most influential person					
Valid	Teachers	13	8.7	8.7	8.7

	Friends	116	77.3	77.3	86
	Parents	5	3.3	3.3	89.3
	Others	16	10.7	10.7	100
	Total	150	100	100	

Table 2: The demographic information of respondents

	N	Mean	Std. Deviation	Variance
Relevance				
REV	150	3.8267	0.85025	0.723
Valid N (listwise)	150			
REV_1	150	3.73	0.967	0.935
REV_2	150	3.82	0.963	0.927
REV_3	150	3.93	0.906	0.82
Valid N (listwise)	150			
Voluntariness				
VOL	150	3.8022	0.68444	0.468
Valid N (listwise)	150			
VOL_1	150	4.24	0.841	0.707
VOL_2	150	3.39	1.023	1.046
VOL_3	150	3.77	0.891	0.794
Valid N (listwise)	150			
Performance Expectancy				
PU	150	3.6933	0.84037	0.706
Valid N (listwise)	150			
PU_1	150	3.83	0.893	0.798
PU_2	150	3.63	0.923	0.851
PU_3	150	3.61	0.975	0.95
Valid N (listwise)	150			
Effort Expectancy				

PEOU	150	3.8289	0.70657	0.499
Valid N (listwise)	150			
PEOU_1	150	4.11	0.734	0.539
PEOU_2	150	3.57	0.979	0.958
PEOU_3	150	3.81	0.903	0.815
Valid N (listwise)	150			
Social Factors				
SF	150	3.4383	0.64045	0.41
Valid N (listwise)	150			
SF_1	150	3.82	0.715	0.511
SF_2	150	3.36	0.892	0.796
SF_3	150	3.2	0.867	0.752
SF_4	150	3.37	0.832	0.692
Valid N (listwise)	150			
Facilitating Conditions				
FC	150	3.6667	0.63303	0.401
Valid N (listwise)	150			
FC_1	150	3.63	0.824	0.678
FC_2	150	3.6	0.927	0.859
FC_3	150	3.92	0.84	0.705
FC_4	150	3.52	0.918	0.842
Valid N (listwise)	150			
Attitude towards Behavior				
AT	150	3.7167	0.77051	0.594
Valid N (listwise)	150			
AT_1	150	3.83	0.88	0.775
AT_2	150	3.76	0.887	0.788
AT_3	150	3.63	0.923	0.851
AT_4	150	3.65	0.956	0.915
Valid N (listwise)	150			
Behavioral Intention				
BI	150	3.7867	0.88868	0.79
Valid N (listwise)	150			

BI_1	150	3.85	0.961	0.923
BI_2	150	3.73	0.982	0.965
Valid N (listwise)	150			

Table 3: Descriptive Statistics

Relevance

The overall mean of attribute “Relevance” was 3.83. It means that the respondents rated the attribute “Relevance” positively. From the five-point scale in the questions related to the attribute “Relevance”, point 3 indicated “Neutral”, so, the value 3.83 indicated that the respondents agreed “Relevance” was important on the intention to use a mobile device for learning. Item REV_3 gained the highest mean with the statement “The use of mobile learning is appropriate to my different studies-related tasks.”

Voluntariness

The overall mean of attribute “Voluntariness” was 3.80. It means that the respondents rated the attribute “Voluntariness” positively. From the five-point scale in the questions related to the attribute “Voluntariness”, point 3 indicated “Neutral”, so, the value 3.80 indicated that the respondents agreed “Voluntariness” was important on the intention to use a mobile device for learning. Item VOL_1 gained the highest mean with the statement “It is voluntary for me to use mobile devices.”

Performance Expectancy

The overall mean of attribute “Performance Expectancy” was 3.69. It means that the respondents rated the attribute “Performance Expectancy” positively. From the five-point scale in the questions related to the attribute “Performance Expectancy”, point 3 indicated “Neutral”, so, the value 3.69 indicated that the respondents agreed “Performance Expectancy” was important on the intention to use a mobile device for learning. Item PU_1 gained the highest mean with the statement “Using mobile devices could make me easier to learn.”

Effort Expectancy

The overall mean of attribute “Effort Expectancy” was 3.83. It means that the respondents rated the attribute “Effort Expectancy” positively. From the five-point scale in the questions related to the attribute “Effort Expectancy”, point 3 indicated “Neutral”, so, the value 3.83 indicated that the respondents agreed “Effort Expectancy” was important on the intention to use a mobile device for learning. Item PEOU_1 gained the highest mean with the statement “Learning to use mobile devices is easy for me.”

Social Factors

The overall mean of attribute “Social Factors” was 3.44. It means that the respondents rated the attribute “Social Factors” positively. From the five-point scale in the questions related to the attribute “Social Factors”, point 3 indicated “Neutral”, so, the value 3.44 indicated that the respondents agreed “Social Factors” was important on the intention to use a mobile device for learning. Item SF_1 gained the highest mean with the statement “My interaction with a mobile devices would be clear and understandable.”

Facilitating Conditions

The overall mean of attribute “Facilitating Conditions” was 3.67. It means that the respondents rated the attribute “Facilitating Conditions” positively. From the five-point scale in the questions related to the attribute “Facilitating Conditions”, point 3 indicated “Neutral”, so, the value 3.67 indicated that the respondents agreed “Facilitating Conditions” was important on the intention to use a mobile device for learning. Item FC_3 gained the highest mean with the statement “I have the knowledge necessary to use mobile devices for learning.”

Attitude towards Behavior

The overall mean of attribute “Attitude towards Behavior” was 3.72. It means that the respondents rated the attribute “Attitude towards Behavior” positively. From the five-point scale in the questions related to the attribute “Attitude towards Behavior”, point 3 indicated “Neutral”, so, the value 3.72 indicated that the respondents agreed “Attitude towards Behavior” was important on the intention to use a mobile device for learning. Item AT_1 gained the highest mean with the statement “Using mobile devices for learning would be a very good idea.”

Behavioral Intention

The overall mean of attribute “Behavioral Intention” was 3.79. It means that the respondents rated the attribute “Behavioral Intention” positively. From the five-point scale in the questions related to the attribute “Behavioral Intention”, point 3 indicated “Neutral”, so, the value 3.79 indicated that the respondents agreed “Behavioral Intention” was important on the intention to use a mobile device for learning. Item BI_1 gained the highest mean with the statement “I intend to use mobile devices whenever possible.”

Pearson Correlation among Components

If the result of the Pearson Correlation Coefficient is positive (+), it indicates that when the value of one variable increase, the value of another variable also increase, vice versa. Otherwise, if the result is negative (-), it indicates that when the value of one variable increase, the value of another variable would decrease. Besides, the range of the Pearson correlation coefficient (r) is from -1 to +1. If the coefficient (r) is close to +1 or -1, it refers that there is a strong relationship between two variables, one variable is strong correlated with another variable. Otherwise, when the value of coefficient (r) is close to 0, it refers that there is a weak relationship between two variables, one variable is not correlated with another variable. Moreover, if the significance level (2-tailed) is less or equal to 0.05, it means that there is a statistically significant correlation between two variables. If the significance level is greater than 0.05, it means that there is no significant correlation between two variables. According to Evans (1996), the absolute values of Pearson Correlation Coefficient has the following meanings:

Coefficient(r)	Relationship Representing
.00 - .19	“Very Weak”
.20 - .39	“Weak”
.40 - .59	“Moderate”
.60 - .79	“Strong”
.80 – 1.00	“Very Strong”

Relationship between Relevance and Performance Expectancy

The correlation between Relevance and Performance Expectancy is $r = 0.610$ and $p = 0.000$. Therefore H1: There is a positive effect of Relevance to the Performance Expectancy” is supported.

Relationship between Voluntariness and Behavioral Intention

The correlation between Voluntary and Behavioral Intention is $r = 0.101$ and $p = 0.218$. Therefore, “H2: There is a positive influence of Voluntary to the Behavioral Intention” is not supported.

Relationship between Effort Expectancy and Performance Expectancy

The correlation between Effort Expectancy and Performance Expectancy is $r = 0.339$, $p = 0.000$. Therefore, “H3: There is a positive influence of Effort Expectancy to the Performance Expectancy” is supported.

Relationship between Performance Expectancy and Attitude towards Behavior

The correlation between Performance Expectancy and Attitude toward Behavior is $r = 0.703$ and $p = 0.000$. Therefore, “H4: Performance Expectancy has a positive relationship with Attitude towards Behavior” is supported.

Relationship between Effort Expectancy and Attitude towards Behavior

The correlation between Effort Expectancy and Attitude towards Behavior is $r = 0.542$ and $p = 0.000$. Therefore, “H5: Effort Expectancy has a positive relationship with Attitude towards Behavior” is supported.

Relationship between Social Factors and Attitude towards Behavior

The correlation between Social Factors and Attitude towards Behavior is $r = 0.678$ and $p = 0.000$. Therefore, “H6: Social Factors has a positive relationship with Attitude towards Behavior” is supported.

Relationship between Facilitating Conditions and Attitude towards Behavior

The correlation between Facilitating Conditions and Attitude towards Behavior is $r = 0.604$ and $p = 0.000$. Therefore, “H7: Facilitating Conditions has a positive relationship with Attitude towards Behavior” is supported.

Relationship between Performance Expectancy and Behavioral Intention

The correlation between Performance Expectancy and Behavioral Intention is $r = 0.587$, $p = 0.000$. Therefore, “H8: There is a positive influence of Performance Expectancy to the Behavioral Intention.” is supported.

Relationship between Effort Expectancy and Behavioral Intention

The correlation between Effort Expectancy and Behavioral Intention is $r = 0.358$ and $p = 0.000$. Therefore, “H9: There is a positive influence of Effort Expectancy to the Behavioral Intention” is supported.

Relationship between Social Factors and Behavioral Intention

The correlation between Social Factors and Behavioral Intention is $r = 0.591$ and $p = 0.000$. Therefore, “H10: There is a positive influence of Social Factors (S.F.) to the Behavioral Intention” is supported

Relationship between Facilitating Conditions and Behavioral Intention

The correlation between Facilitating Conditions and Behavioral Intention is $r = 0.507$ and $p = 0.000$. Therefore, “H11: There is a positive influence of Facilitating Conditions to the Behavioral Intention” is supported.

Relationship between Attitude towards Behavior and Behavioral Intention

The correlation between Attitude towards Behavior and Behavioral Intention is $r = 0.752$ and $p = 0.000$. Therefore, “H12: Attitude towards Behavior has a positive effect on Behavior Intention” is supported.

Result of Relationships among all components

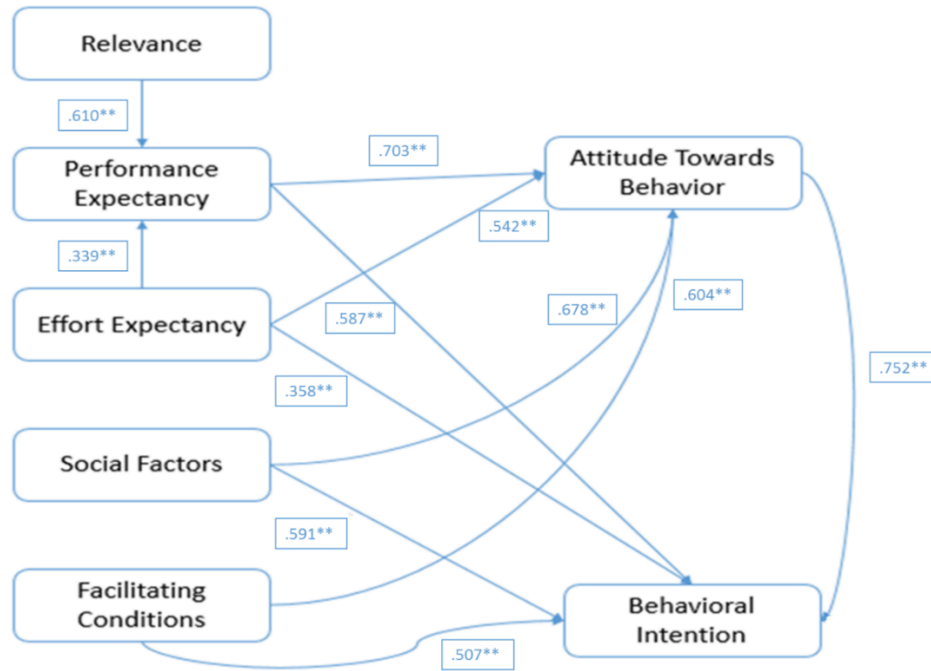


Figure 4: Resulting Model of the relationships among all components

The resulting model is shown in [Figure 4].

Comparison of Students’ Performance Expectancy between different Genders

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
PU	Male	89	3.6704	.93541	.09915
	Female	61	3.7268	.68451	.08764

Table 4: Summary of Gender statistics on Performance Expectancy

The t-test of Gender on Performance Expectancy was 0.671, which was greater than 0.05. Therefore, there was no statistically significant gender difference about Performance Expectancy in using mobile devices for learning.

From [table 4], it showed that the mean value for male students was 3.6704 whereas the mean value for female students was 3.7268, thus, from the perspective of Performance Expectancy, there was no significant difference on both gender.

DISCUSSION OF THE FINDINGS

Discussion for the relationship between Relevance and Performance Expectancy

From the result of “Relationship between Relevance and Performance Expectancy”, the Pearson correlation coefficient (r) between Relevance and Performance Expectancy was 0.610**, it represents that there was a significant relationship between Relevance and Performance Expectancy. The result indicated that there is a strong statistical correlation between Relevance and Performance Expectancy. Agudo, Hernandez & Pascual (2013) proposed a structural model analysis, the Pearson correlation coefficient (r) for the hypothesis “Relevance for learning positively predicts perceived usefulness of e-learning systems by students” was 0.48***, and the hypothesis was supported and adopted in the final model. According to Goodhue (1995), there was an interactive effect between job relevance and perceived usefulness. The research proposed that judgments on usefulness is affected by job relevance, although the interaction was not explicitly hypothesized, such kind of interaction could be observed. A possible explanation could be, students were required to use mobile devices with a view to complete the assignments, and so, they tend to believe that mobile devices is useful for them. Hence, the hypothesis proposed in this investigation H1 is supported.

Discussion for the relationship between Voluntariness and Behavioral Intention

From “Relationship between Voluntariness and Behavioral Intention”, the result showed that the Pearson correlation coefficient was 0.101, it means that there was no significant relationship between Voluntariness and Behavioral Intention. According to the previous literature review, Sun and Zhang (2006) proposed that voluntariness could help shape the behavioral intention to accept a technology, however, the result showed in “Relationship between Voluntariness and Behavioral Intention” proved that the voluntariness to use mobile devices was not significantly related to the intention of a user to accept mobile learning. It could be explained as even though students were using mobile devices voluntarily, it does not represent that they were enjoying, maybe they just have to accomplish certain targets, and thus, the behavioral intention could be relatively low. So, it can be concluded that there is no significant relationship between voluntariness and behavioral intention. So, the hypothesis H2 was rejected.

Discussion for the relationship between Effort Expectancy, Performance Expectancy and Behavioral Intention

Effort Expectancy Vs Performance Expectancy

From the result of “Relationship between Effort Expectancy and Performance Expectancy”, the Pearson correlation coefficient (r) between Effort Expectancy and Performance Expectancy was 0.339**, it represents that there was a significant relationship between Effort Expectancy and Performance Expectancy. The result indicated that there is a weak statistical correlation between Effort Expectancy and Performance Expectancy. Also, there are various research confirming the relationship between Effort Expectancy and Performance Expectancy.

Agudo, Hernandez & Pascual (2013) performed an experiment related to the acceptance of electronic learning systems, the result supported the hypothesis H3 which confirmed that Effort Expectancy will positively affects the Performance Expectancy.

A research proposed by Vasileios & Anastasios (2011) also showed that Effort Expectancy will have a positive effect on the performance expectancy, the result pointed out that effort expectancy has a significant effect on the performance expectancy. As the concept mentioned in Venkatesh et al. (2003), students in universities may perceived mobile learning is useful if mobile learning did not require special techniques.

Performance Expectancy Vs Behavioral Intention

Besides, from the result of “Relationship between Performance Expectancy and Behavioral Intention”, the Pearson Correlation Coefficient between Performance Expectancy and Behavioral Intention was 0.587**, it means that there is a significant relationship among the above mentioned components. Moreover, King & He (2006b) indicated that most studies found that Performance Expectancy strongly affect the Behavioral Intention, and this result is consistent with various studies, such as Wong & Hiew (2005) and Kim & Garrison (2009).

Effort Expectancy Vs Behavioral Intention

Besides, Vasileios & Anastasios (2011) performed an experiment on the acceptance of computer-based assessment, the result showed that the Pearson Correlation coefficient between Effort Expectancy and Behavioral Intention was 0.202***, and the hypothesis “Perceived Ease of Use will have a positive effect on the Behavioral Intention” was supported. Meanwhile, the impact of Effort Expectancy on Behavioral Intention was mostly via Performance Expectancy. In this investigation, perceived usefulness and perceived ease of use of mobile learning are two crucial factors to affect the students’ intention to accept mobile learning. Thus, hypotheses H3, H8 and H9 were supported.

Discussion for the relationship between Performance Expectancy and Attitude towards Behavior

From the result of “Relationship between Performance Expectancy and Attitude towards Behavior”, the Pearson correlation coefficient (r) between Performance Expectancy and Attitude towards Behavior was 0.703**, it represents that there was a significant relationship between Performance Expectancy and Attitude towards Behavior. The result indicated that there is a strong statistical correlation between Performance Expectancy and Attitude towards Behavior. Also, there are various research confirming the relationship between Performance Expectancy and Attitude towards Behavior. Chang et al. (2009) investigated the acceptance of mobile learning in Thailand via distributing questionnaires. The result found that the correlation (r) between Performance Expectancy and Attitude towards Behavior was 0.398*** and the hypothesis “PE has a significant positive relationship with AT” was supported. In this survey, it could be explained as, once students perceived that mobile devices is useful for self-learning, they would have a better positive attitude towards mobile learning. Thus, H4 was supported.

Discussion for the relationship between Effort Expectancy and Attitude towards Behavior

The relationship between Effort Expectancy and Attitude towards Behavior was investigated in “Relationship between Effort Expectancy and Attitude towards Behavior”, the result showed that the Pearson Correlation coefficient was 0.542** and the hypothesis H5 was supported. Chang et al. (2009) investigated the acceptance of mobile learning in Thailand via distributing questionnaires. The result found that the correlation (r) between Effort Expectancy and Attitude towards Behavior was 0.219*** and the hypothesis “EE has a significant positive relationship with AT” was supported. So, it can be concluded that the degree of ease of use could determine the attitude towards the acceptance of mobile learning. Thus, H5 was supported.

Discussion for the relationship between Social Factors, Attitude towards Behavior and Behavioral Intention

The Pearson correlation coefficient among the relationship between social factors and attitude towards behavior was 0.678** and the coefficient among the relationship between social factors and behavioral intention was 0.591**, the result indicated that hypotheses **H6 and H10** were supported. Following are literatures supporting the above-mentioned two hypotheses. Chang et al. (2009) investigated the acceptance of mobile learning in Thailand via distributing questionnaires. The result found that the correlation (r) between Social Factors and Attitude towards Behavior was 0.142** and the hypothesis “SFs has a significant positive relationship with AT” was supported. Marchewka & Liu (2007) found that the correlation coefficient between Social Factors and Attitude toward Behavior was 0.501** and it showed that Social Factors has a significant impact on the Attitude towards Behavior.

Besides, an investigation performed by Ayman (2012) proved that Social Factors could positively affect the Attitude towards Behavior. However, there is a research found that the social factors was the weakest variable to influence the acceptance level of mobile learning. Jairak, Praneetpolgrang & Mekhabunchakij (2009) found that among various variables, such as performance expectancy, effort expectancy and social factors, social factors was the weakest variable since students might not be affected by others, this research was further supported by Alawadhi & Morris (2008). Actually, social factors is crucial in affecting the acceptance of mobile learning among students. Since the rapid development of technology, students tend to use tablets for studying, and it becomes a norm in universities. Once students perceived that Social Factors are important for them and they have a positive attitude towards mobile learning, their intention might increase correspondingly. So, I strongly believed that social factors is crucial for students to accept mobile learning.

Discussion for the relationship between Facilitating Conditions, Attitude towards Behavior and Behavioral Intention

Facilitating Conditions Vs Attitude towards Behavior

From “Relationship between Facilitating Conditions and Attitude towards Behavior”, the Pearson Correlation Coefficient between Facilitating Condition and Attitude towards Behavior was 0.604**, implying there is a significant relationship between these two components. An investigation conducted by Marchewka & Liu (2007) showed that the correlation coefficient between facilitating conditions and attitude towards behavior was 0.470**, indicating there is a significant relationship among the above-mentioned variables. Ayman (2012) conducted a survey to investigate the acceptance of mobile learning for higher school students in Saudi Arabia, the summary of hypotheses showed that the hypothesis “Facilitating conditions will have a positive influence on attitude towards behavior” was supported and the correlation coefficient was 0.210**.

Facilitating Conditions Vs Behavioral Intention

From “Relationship between Facilitating Conditions and Behavioral Intention”, the Pearson Correlation Coefficient between Facilitating Condition and Behavioral Intention was 0.507**, indicating there is a significant relationship among these two components. Chang et al. (2009) investigated the acceptance of mobile learning in Thailand via distributing questionnaires. The result found that the correlation (r) between Facilitating Conditions and Behavioral Intention was 0.257*** and the hypothesis “FCs has a significant positive relationship with BI” was supported. In universities, the environmental factors such as the availability of mobile devices, the learning environment could have a vital impact on the students’ attitude and intention to perform mobile learning, the more resources they get, the higher chance they perform mobile learning. Therefore, hypotheses H7 and H11 were supported.

Discussion for the relationship between Attitude towards Behavior and Behavioral Intention

From “Relationship between Attitude towards Behavior and Behavioral Intention”, the Pearson Correlation Coefficient between Attitude towards Behavior and Behavioral Intention was 0.752**, indicating there is a positive, significant relationship among these two components. Different researches have provided evidence on such relationship. Chang et al. (2009) investigated the acceptance of mobile learning in Thailand via distributing questionnaires. The result found that the correlation (r) between Attitude towards Behavior and Behavioral Intention was 0.278*** and the hypothesis “Attitude towards Behavior has a significant positive relationship with Behavioral Intention” was supported. So, H12 was supported.

Discussion for the relationship between gender difference and Performance Expectancy

The UTAUT model attempts to explain how the difference among individuals, such as gender, age and experience could affect technology use. As the original model proposed by Venkatesh, et.al. (2003) as follows, it can be observed that the Performance Expectancy could be moderated by gender. From the result of “Comparison of Students’ Performance Expectancy between different Genders”, it can be concluded that gender is not a crucial factor on behavioral intention and there is no significant effect of different genders on Performance Expectancy. However, Jack & Chang (2007) mentioned that the strength between Performance Expectancy and Behavioral Intention varies with gender such that it is more significant for male and young workers. The result from the research was conflict with the result from “Comparison of Students’ Performance Expectancy between different Genders”. A possible explanation is, different results would be generated depending on different situations. In this survey, Performance Expectancy refers to whether students agree that mobile learning is useful for them, the context is the academic field. Thus, it seems that gender difference would not affect the perceived usefulness of mobile learning.

CONCLUSION AND RECOMMENDATION

A new research model was generated after this investigation, it is an important outcome as it could be used to explain students’ acceptance on mobile learning. The main summary of this project is as follows. In this project, the main purpose is to investigate the general acceptance of mobile learning among university students and to identify factors which can affect the intention to accept mobile learning. Students from different universities were invited to provide valuable data via the distribution of questionnaires. For the questionnaires, Likert Scale has been adopted and it consists of five scales, students were required to select one scale for each question. Besides, an independent samples t-test was carried out to test whether personal factors such as gender will affect the acceptance of mobile learning. In this survey, the relationship between gender difference and Performance

Expectancy was investigated. Also, the relationship between diverse independent variables in the proposed model were tested.

From the result generated from the independent samples T-test, there was no statistically significant gender difference about Performance Expectancy in using mobile devices for learning. It can be concluded that gender difference would not affect the Performance Expectancy, it means that gender is not a crucial factor on deciding whether mobile learning is useful. Apart from the independent samples T-test, the Pearson Correlation between different variables were tested and it focuses on testing whether there is significant relationship exists between two variables. The survey result supported the hypotheses H1, H3 to H12, but the hypothesis H2 was rejected. H1 and H2 were originated from the Technology Acceptance Model (TAM) whereas hypotheses H3 to H12 were originated in the Unified Theory of Acceptance and Use of Technology Model (UTAUT model). Based on the result of the Pearson Correlation Coefficient (r), the following hypotheses H1, H3, H4, H5, H6, H7, H8, H9, H10, H11, H12 were supported. However, hypothesis H2 was rejected.

REFERENCES

- Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). *Perceived Usefulness, Ease of Use and Usage of Information Technology: A Replication*. MIS Quarterly, 16, 227-247.
- Agudo-Peregrina, A.F., et al. (2013). *Behavioral intention, use behavior and the acceptance of electronic learning systems: Differences between higher education and lifelong learning*. Computers in Human Behavior
- Alawadhi, S., & Morris, A. (2008). *The use of the UTAUT model in the adoption of egovernment services*. Kuwait Paper presented at the Proceedings of the 41st Hawaii International Conference (p.219). Kuwait: System Sciences.
- Aldhaban, F. (2012). *“Exploring the Adoption of Smartphone Technology: Literature Review”*, 2012 Proceedings of PICMET’12: Technology Management for Emerging Technologies
- Alrawashdeh, T. A., Muhairat, M. I., & Alqatawnah, S. M. (2012). *Factors affecting acceptance of web-based training system: Using extended UTAUT and structural equation modeling*. arXiv preprint arXiv:1205.1904.
- Ayman Bassam Nassuora (2012). *Students Acceptance of Mobile Learning for Higher Education in Saudi Arabia*, 4(2), 24-30
- Bagozzi, R., Baumgartner, H. & Yi, Y., (1992). *State versus Action Orientation and the Theory of Reasoned Action: An Application to Coupon Usage*. Journal of Consumer Research, 18, pp.505-18.
- Bakia, M., & Mitchell, K., & Yang, E. (2007). *State strategies and practices for educational technology: Volume I—Examining the Enhancing Education through Technology program*. U.S. Department of Education

- Bruner, G. C., II, & Kumar, A. (2005). *Explaining consumer acceptance of handheld Internet devices*. Journal of Business Research, 58(5), 553–558.
- Chang, Jui-Ling & Pang-Tien Lieu & Jung-Hui Liang & Hsiang-Te Liu & Kallaya Jairak, & Prasong Praneetpolgrang, & Kittima Mekhabunchakij (2009). *An Acceptance of Mobile Learning for Higher Education Students in Thailand*. The Sixth International Conference on eLearning for Knowledge-Based Society, 17-18 December 2009, Thailand
- Childers, T. L., Carr, C. L., Peck, J., & Carson, S. (2001). *Hedonic and utilitarian motivations for online retail shopping behavior*. Journal of Retailing, 77(4), 511–535.
- Coates, J. (1986). *Women, Men and Languages: Studies in Language and Linguistics*, Longman, London
- Dabholkar, P. A., & Bagozzi, R. P. (2002). *An attitudinal model of technology-based selfservice: Moderating effects of consumer traits and situational factors*. Journal of the Academy of Marketing Science, 30(3), 184–201.
- Davis, F. (1986). *Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results*, doctoral dissertation, MIT
- Davis, F. (1989). *Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology*, MIS Quarterly (13:3), 319-340.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). *Extrinsic and intrinsic motivation to use computers in the workplace*. Journal of Applied Social Psychology, 22(14), 1111–1132.
- Dewitt, D., & Siraj, S. (2011). *Learners' perceptions of technology for design of a collaborative m-Learning module*. World Journal on Educational Technology, 2(3).
- El-Gayar, O., & Moran, M., & Hawkes, M. (2011). *Students' Acceptance of Tablet PCs and Implications for Educational Institutions*. Journal of Educational Technology & Society, 14 (2), 58-70.
- Eristi, S. D., & Haseski, H. I., & Uluuysal, B., & Karakoyun, F. (2011). *The Use of Mobile Technologies in Multimedia-Supported Learning Environments*. The Turkish Online Journal of Distance Education, 12 (3), 130-141.
- Evans, D.J. (1996). *Straightforward Statistics for the Behavioral Sciences*. Brooks/Cole Pub Co.
- Foon, Y. S., & Fah, B. C. Y. (2011). *Internet banking adoption in Kuala Lumpur: an application of Utaut model*. International Journal of Business and Management, 6(4), p161.
- Fornell, C., & Larcker, D.F. (1981). *Evaluating structural equation models with unobservable variables and measurement error*. Journal of Marketing Research, 18 (1), 39-50
- Goodhue, D. L. (1995). *Understanding the linkage between user evaluations of systems and the underlying systems*. Management Sci. 41. 1827-1844.
- Gutiérrez, E., Trenas, M. A., Ramos, J., Corbera, F., & Romero, S. (2010). *A new Moodle module supporting*

- automatic verification of VHDL-based assignments*. Computers & Education, 54, 562–577.
- Hahn J. (2008). *Mobile Learning for the Twenty – First Century Librarian*. Reference Services Review, 36 (3), 272-288
- Herrington, A., & Herrington, J. (2007). *Authentic mobile learning in higher education*. Paper presented at Australian Association for Research in Education
- Hong, S. H., Thong, J. Y. L., & Tam, K. Y. (2006). *Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet*. Decision Support Systems, 42(3), 1819–1834
- Hu, J., Chau, Y. K., Sheng, R. L., & Tam, K. Y. (1999). *Examining technology acceptance model using physician acceptance of telemedicine technology*. Journal of Information Management, 43(6), 740–755.
- Igbaria, M., & Iivari, J. (1995). *The effects of self-efficacy on computer usage*. Omega, International Journal of Management Science, 23(6), 587–605. Industry Management, 14(5), 501–519.
- Jack T. Marchewka & Chang Liu. (2007). *An Application of the UTAUT Model for Understanding Student Perceptions Using Course Management Software*. Communications of the IIMA, 7 (2)
- Jairak, K., Praneetpolgrang, P., & Mekhabunchakij, K. (2009). *An acceptance of mobile learning for higher education students in Thailand*. Special Issue of the international Journal of the Computer, the Internet and Management, 17(3), 17-18
- Keegan, D. (2005). *The incorporation of mobile learning into mainstream education and training*. 4th World Conference on m-Learning. South Africa: Cape Town.
- Kim, S.H. and G. Garrison (2009). *Investigating mobile wireless technology adoption: An extension of the technology acceptance model*. Inf. Syst. Front., 11: 323-333.
- King, W. R., & He, J. (2006a). *A meta-analysis of the technology acceptance model*.
- King, W. R., & He, J. (2006b). *A meta-analysis of the technology acceptance model*. Information Management, 43(6), 740–755.
- Liaw, S. S., & Huang, H. M. (2003). *An investigation of user attitudes toward search engines as an information retrieval tools*. Computers in Human Behavior, 19(6), 751–765.
- Lucas, H.C. and Spitler, V.K. (1999). *Technology Use and Performance: A Field Study of Broker Workstations*, Decision Science 30(2), 291-311.
- Ma, Q., & Liu, L. (2004). *The technology acceptance model: a meta-analysis of empirical findings*. Journal of Organizational and End User Computing, 16, 59–72.
- Macharia, J. (2010). *The Influence of E-mail on Students' Learning in Higher Education: An Extension to the Technology Acceptance Model (TAM)*. Asian Journal of Information Technology, 9 (3), 123-132.
- Marchewka, Liu. , & Kostiwa. (2007). *An Application of the UTAUT Model for Understanding Student*

Perceptions Using Course Management Software. 7 (2)

- Martin, S., & Diaz, G., & Sancristobal, E., & Gil, R., & Castro, M., & Peire, J. (2011). *New technology trends in education: Seven years of forecasts and convergence*. Computers & Education, 57(3), 1893-1906.
- Mathieson, K. (1991). *Predicting user intentions: comparing the technology acceptance model with the theory of planned behavior*. Information Systems Research, 2(3), 173–191.
- Mottiwalla, L. F. (2007). *Mobile learning: A framework and evaluation*. Computers in Education, 49(3), 581–596.
- Ndubisi, N., (2006). *Factors of Online Learning Adoption: A Comparative Juxtaposition of the Theory of Planned Behaviour and the Technology Acceptance Model*. International Journal on e-Learning, 5(4), pp.571-91.
- Nunnally, J.C., (1978), *Psychometric Theory*, New York: McGraw-Hill.
- Ozdemir, S. (2010). *Supporting printed books with multimedia: A new way to use mobile technology for learning*. British Journal of Educational Technology, 41 (6), 35-38.
- Peng, H., Su, Y.-J., Chou, C., & Tsai, C.-C. (2009). *Ubiquitous knowledge construction: Mobile learning re-defined and a conceptual framework*. Innovations in Education and Teaching International, 46(2), 171-183. Doi:10.1080/14703290902843828
- Roschelle, J., Sharples, M., & Chan, T. W. (2005). *Introduction to the special issue on wireless and mobile technologies in education*. Journal of Computer Assisted Learning, 21, 159-161
- Schepers, J. and Wetzels, M. (2007). *A Meta-analysis of the Technology Acceptance Model: Investigating Subjective Norm and Moderation Effects*, Information and Management (44), pp. 90-103.
- Schepers, J. J. L., & Wetzels, M. G. M. (2006). *Technology acceptance: a meta-analytical view on subjective norm*. In Proceedings of the 35th European Marketing Academy Conference, Athens, Greece.
- Shang, R. A., Chen, Y. C., & Shen, L. (2005). *Extrinsic versus intrinsic motivations for consumers to shop online*. Information & Management, 42(3), 401–413.
- Shaper L.K & Pervan G.P (2007). *ICT and OTS A model of Information and Communication Technology Acceptance and Utilizations by Occupational Therapist. International journal of Medical Informatics .76(1): S212-S221*.
- Sharples, M., & Sanchez, A., & Milrad, M., & Vavoula, G. (2008). *Mobile learning: Small devices, big issues*. In N. Balacheff, & S. Ludvigsen, & T. de Jong, A. Lazonder & S.Barnes (Eds.), *Technology enhanced learning: Principles and products*. Heidelberg, Germany: Springer. 233-249
- Suki, N. M., & Suki, N. M. (2011). *Users' Behavior towards Ubiquitous M-Learning*. The Turkish Online Journal of Distance Education, 12 (3), 118-129.
- Sun, H. & Zhang, P. (2006). *The role of affect in IS research: A critical Survey and a research Model*. In: P. Zhang and Galletta, Humain-Computer
- Tannen, D. (1990). *You Just Don't Understand: Women and Men in Conversation*, Ballantine, NY.

- Taylor, S. & Todd, P., (1995). *Understanding Information Technology Usage: A Test of Competing Models*. Journal of Information Systems Research, 6(2), pp.144-76.
- Teo, T., (2011). *Factors influencing teachers' intention to use technology: Model development and Test*. Computers & Education, 57, pp.2432-40.
- Valk, J., Rashid, A. T., & Elder, L. (2010). *Using mobile phones to improve educational outcomes: An analysis of evidence from Asia*. International Review of Research in Open and Distance Learning, 11(1), 117–140.
- Vasileios Terzis & Anastasios A. Economides (2011). *The acceptance and use of computer based assessment*. Computers & Education 56, 1032–1044
- Venkatesh, V., and Bala (2008). *Technology Acceptance Model 3 and a Research Agenda on Interventions*, Decision Sciences 39(2), 273-315.
- Venkatesh, V., and Davis, F. D. (2000). *A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies*, Management Science (46:2), pp. 186-204.
- Venkatesh, V., Morris, M., Davis, G.B., and Davis, F.D. (2003). *User Acceptance of Information Technology: Toward a Unified View*, MIS Quarterly (27:3), pp. 425-78.
- Wains, S., & Mahmood, W. (2008). *Integrating m-Learning with e-learning. Paper presented at the 9th ACM Special Interest Group for Information Technology Education (SIGITE'08)*, Ohio, USA.
- Williams, A. J., & Pence, H. E. (2011). *Smart Phones, a Powerful Tool in the Chemistry Classroom*. Journal of Chemical Education, 88 (6), 683-686.
- Wong, C.C. and P.L. Hiew (2005). *Diffusion of mobile entertainment in Malaysia: Drivers and barriers*. Enformika, 5:263-266.
- Yamin, M., & Lee, Y. (2010). *Level of acceptance and factors influencing students' intention to use UCSI University's e-mail system*. Paper presented at the User Science and Engineering (i-USer), 2010 International Conference on.
- Zack, M. H. (1993). *Interactivity and Communication Mode Choice in Ongoing Management Groups*, Information Systems Research (4:3), 207-239.

Analysis of Symbolic Number Comparison Tasks in Terms of Numerical Stroop and Distance Effect

Yılmaz MUTLU

Muş Alparslan University

y.mutlul@alparslan.edu.tr

Sinan OLKUN

TED University

sinan.olkun@tedu.edu.tr

ABSTRACT

The purpose of this study is to examine symbolic number comparison tasks in terms of stroop and distance effect. Participants in the study consisted of 313 third grade students, 157 girls and 156 boys, randomly selected from 17 different primary schools from two cities located in different regions of Turkey. The symbolic number comparison test used as data collection tool in the study contains 36 items. The test was designed according to stroop and distance effect and administered on a tablet computer. Data were analysed in terms of 1, 2, 3 distance and congruent, incongruent and neutral cases between the pairs of numbers. The results show that correlation between accuracy of incongruent items and the total correct number response is highest (.929) and there are meaningful differences between all variables in term of accuracy and response time. The Stroop and distance effects were also confirmed by the results.

Keywords: Stroop effect, Distance effect, Number comparison task, Dyscalculia

INTRODUCTION

Symbolic number comparison (SNC) is considered one of the basic number competencies. (Gilmore, McCarthy, & Spelke, 2010). This task was designed to assess the capacity to order numerosities by magnitude and to understand the numerals (Iuculano et al., 2008). In fact, there is a very high correlations between performance in SNC and curriculum based mathematics achievement (Olkun, Altun et al. 2015). Performance in SNC has also been found to be related to other basic number competencies such as dot enumerations and mental number line (MNL) estimations (Olkun, Altun et al. 2015). The results of many studies show that SNC tasks is a predictor of mathematics success (Sasanguie, De Smedt, Defever, & Reynvoet 2012).

The distance and stroop effect paradigms were used in developing SNC test. The distance effect in a comparison task (the comparison distance effect; CDE) entails that it is harder to discriminate between two numbers that are numerically close compared to numbers that are numerically far apart. In other words, the distance effect (Dehaene, Dupoux, & Mehler, 1990) means that as the numerical difference between the compared numbers increases, the correct response rate increases and the response time decreases. Any child can decide on which number is larger but it takes longer for the slow learners. In these tasks latency is more important than accuracy. It is reported that individual differences in the distance effect were related to mathematics achievement and this relationship was found to be specific to symbolic numerical comparison (Holloway & Ansari, 2009).

In the stroop tasks, subjects are asked to pick either the numerically or the physically larger of the two numbers (see Figure 1). In numerical stroop tasks subjects' decisions are interfered with the use of physically incongruent numerals. The size congruity effect in numerical comparison tasks has been found in subjects at different ages from children to adults (i.e., relative to a neutral control, corresponding physical sizes expedited, and different sizes interfered with the numerical comparison). Dyscalculic individuals are distracted by the physical size of the number while comparing numerical magnitudes (size-congruity effect) (Girelli, Lucangeli, & Butterworth, 2000; Rubinsten & Henik, 2006). Therefore SNC test is used for determining math performance of student with mathematics learning difficulties.



Figure 1: Sample numerical stroop effect with distance two (incongruent)

METHOD

Participants in the study consisted of 344 third grade students, 173 girls and 171 boys, randomly selected from 17 different primary schools from two cities located in different regions of Turkey.

Symbolic number comparison (SNC) test was used as data collection tool. This test consists of tasks that are prepared in the light of findings based on numerical Stroop paradigm and distance effects. Number pairs ranging from 2 to 9 are presented randomly on a tablet screen. Students were asked to touch a number (which is numerically larger) on tablet screen and the response times were recorded by the software. No physical comparison task has been added here. Only numeric comparison tasks with 1, 2, and 3 unit distances were asked. The numbers tasks presented in three different ways; congruent (2-3) (numerically larger number is also physically larger), incongruent (2-3) (numerically larger number is physically smaller), and neutral (numbers are the same physical size) (2-3). The 36 items included in the test are equally divided into their congruent, incongruent, neutral states. The distances between the numbers in each field are 1, 2 and 3. Table 1 shows the distributions of the items in the test according to the properties mentioned.

Table 1: SNC test items and their properties

	Distance-1	Distance-2	Distance-3
Congruent	5) 7-6, 19) 2-3, 25) 5-4, 27) 8-9	7) 2-4, 8) 5-3, 3) 8-6, 29) 7-9	11) 6-9, 32) 2-5, 34) 7-4, 35) 5-8
Incongruent	10) 4-5, 16) 2-3, 20) 8-9, 31) 7-6	1) 4-2, 6) 3-5, 15) 9-7, 28) 6-8	2) 5-8, 9) 7-4, 36) 9-6, 12) 5-2,
Neutral	13) 6-7, 14) 9-8, 24) 3-2, 30) 5-4	3) 9-7, 4) 2-4, 3-5, 33) 6-8	17) 18) 8-5, 21) 7-4, 9-6, 26) 2-5, 22)

In the analysis, the number of correct answers and average response times that belong to SNC test items were calculated. Then t test was used to compare the averages of item pairs in term of average correct number and response time. Finally, correlation coefficients between variables were calculated.

FINDINGS

The stroop effect, the distance effect, the number of correct responses and the average response times of each pair of numbers in the number comparison test are given in the Table 2 below. We found that 5-8 (distance: 3, Stroop: Congruent) and 7-4 (distance: 3, Stroop: Congruent) number pairs were correctly answered by all participants on the other hand 8-9 (distance: 1, Stroop: Incongruent) number pair were answered by only 239 participants.

Items	N	The pairs	Distance	Stroop	Correct Answers	Average Response Time
1	313	4-2	2	Incongruent	288	1713
2	313	5-8	3	Incongruent	252	1260
3	313	9-7	2	Neutral	309	1306
4	313	2-4	2	Neutral	312	1077
5	313	7-6	1	Congruent	301	1220
6	313	3-5	2	Incongruent	298	1294
7	313	2-4	2	Congruent	310	1112
8	313	5-3	2	Congruent	312	1036
9	313	7-4	3	Incongruent	213	1193
10	313	4-5	1	Incongruent	286	1357
11	313	6-9	3	Congruent	311	1225
12	313	5-2	3	Incongruent	306	1285
13	313	6-7	1	Neutral	306	1418
14	313	9-8	1	Neutral	293	1336
15	313	9-7	2	Incongruent	287	1471
16	313	2-3	1	Incongruent	298	1397
17	313	3-5	2	Neutral	312	1268
18	313	8-5	3	Neutral	303	1241
19	313	2-3	1	Congruent	311	1142
20	313	8-9	1	Incongruent	239	1277
21	313	7-4	3	Neutral	311	1445
22	313	9-6	3	Neutral	313	1307
23	313	8-6	2	Congruent	311	1270
24	313	3-2	1	Neutral	306	1341
25	313	5-4	1	Congruent	311	1213
26	313	2-5	3	Neutral	310	1037
27	313	8-9	1	Congruent	308	1170
28	313	6-8	2	Incongruent	245	1352
29	313	7-9	1	Congruent	311	1191
30	313	5-4	1	Neutral	310	1317
31	313	7-6	1	Incongruent	217	1317
32	313	2-5	3	Congruent	312	1184
33	313	6-8	2	Neutral	309	1320
34	313	7-4	3	Congruent	313	1152
35	313	5-8	3	Congruent	313	1068
36	313	9-6	3	Incongruent	277	1306

Table 2:SNC test items, their properties, the number of correct answers and average response time

Table 3:Each group's average correct answers and average response time

	Number items	Average Correct Answer	Average Response Time
Distance-1	12	11,14	1236,83
Distance-2	12	11,51	1202,39
Distance-3	12	11,29	1172,51
Neutral	12	11,80	1208,93
Congruent	12	11,89	1116,23
Incongruent	12	10,24	1286,52

Each group's average correct answers and average response times are depicted in Table 3. The average response time of incongruent items is the maximum, while the average correct answer of the test is the minimum.

Table 4:Examination of items' correct number in terms of distance effect

	N	X	S.s.	t	p
SNC_D1*	313	11,14	,846	-6,853	.000
SNC_D2**	313	11,51	,670		
SNC_D1	313	11,14	,846	-2,851	.005
SNC_D3***	313	11,29	,748		
SNC_D2	313	11,51	,670	4,299	.000
SNC_D3	313	11,29	,748		

*Distance between item pairs is 1 ** Distance between item pairs is 2 *** Distance between item pairs is 3

The t values of the distance between the items 1, 2 and 3 in terms of the number of correct answers to item pairs were found to be significant at $p < 0.05$ level ($t_{d1d2} = -6,853$ $p = .000$; $t_{d1d3} = -2,851$ $p = .005$; $t_{d2d3} = 4,299$ $p = .000$). These findings show that there is a significant difference between the pairs of items with distance 1, 2 and 3 in terms of the number of correct answers.

Table 5: Examination of items' response times in terms of distance effect

	N	X	S.s.	t	p
SNC_D1RT*	387	1236,81	204,063	3,827	.000
SNC_D2RT	387	1202,32	189,807		
SNC_D1RT	387	1236,81	204,063	6,786	.000
SNC_D3RT	387	1172,47	217,975		
SNC_D2RT	387	1202,32	189,807	3,279	.001
SNC_D3RT	387	1172,47	217,975		

*RT-Response time

The t values of the distance between the items 1, 2 and 3 in terms of average response time of item pairs were found to be significant at $p < 0.05$ significance level ($t_{d1d2} = 3,827$ $p = .000$; $t_{d1d3} = 6,786$ $p = .000$; $t_{d2d3} = 3,279$ $p = .001$). These findings show that there is a significant difference between the pairs of items with distance 1, 2 and 3 in terms of average response time.

Table 6: Examination of items' correct number in terms of Stroop effect

	N	X	S.s.	t	p
SNC_NCN*	313	11,80	,42	-2,95	.003
SNC_CCN**	313	11,90	,40		
SNC_NCN	313	11,80	,42	,81	.000
SNC_ICCN	313	10,24	1,45		
SNC_CC	313	11,90	,40	19,24	.000
SNC_ICCN	313	10,24	1,45		

*Neutral item pairs correct number ** Congruent item pairs correct number *** Incongruent item pair correct number

The t values of difference between the congruent, incongruent and neutral item pairs were found to be significant at $p < 0.05$ significance level ($t_{d1d2} = -2,95$ $p = .003$; $t_{d1d3} = ,81$ $p = .000$; $t_{d2d3} = 19,24$ $p = .000$). These findings show that there is a significant difference between congruent, incongruent and neutral item pairs in terms of the correct number of responses.

Table 7. Examination of items' response times in terms of Stroop effect

	N	X	S.s.	t	p
SNC_NCAT	313	1208,88	222,849	9,257	.000
SNC_CCAT	313	1116,24	197,418		
SNC_NCAT	313	1208,88	222,849	-6,979	.000
SNC_ICCAT	313	1286,47	213,189		
SNC_CCAT	313	1116,24	197,418	-15,838	.000
SNC_ICCAT	313	1286,47	213,189		

The t values of difference between the congruent, incongruent and neutral item pairs were found to be significant at $p < 0.05$ level ($t_{d1d2} = 9,257$ $p = .000$; $t_{d1d3} = -6,979$ $p = .000$; $t_{d2d3} = -15,838$ $p = .000$). These findings show that there is a significant difference between congruent, incongruent and neutral item pairs in terms of the average response time.

Table 8. Correlation between different variables

	DC-2	DC-3	Neutral	Congruent	Incongruent	SNC_TC
DC-1	,192**	,291**	,361**	,135*	,683**	,758**
DC -2		,161**	,149**	,254**	,546**	,606**
DC -3			,196**	,056	,691**	,701**
Neutral				,013	,091	,351**
Congruent					-,056	,208**
Incongruent						,929**

The correlations among the group are depicted in Table 8 and almost all correlations are significant at $p < .001$ level. Correlation between the correct number response of incongruent items and the total correct number response is highest (.929).

CONCLUSIONS

In this study, we examined symbolic number comparison tasks in terms of stroop and distance effect. The results show that correlation between the correct number response of incongruent items and the total correct number response is highest (.929) and there is a meaningful difference between all variables in term of correct answer and response time. The Stroop and distance effects were also confirmed by the results. These results show that numerical comparison tasks can effectively be used in screening for learning difficulties in mathematics.

REFERENCES

- Ansari, D., & Karmiloff-Smith, A. (2002). Atypical trajectories of number development: A neuroconstructivist perspective. *Trends in cognitive sciences*, 6(12), 511-516.
- Atılğan, H. ve Kan, A. ve Doğan, N. (2014). *Eğitimde Ölçme ve Değerlendirme*. Ankara: Anı Yayıncılık.
- Dehaene, S., Dupoux, E., & Mehler, J. (1990). Is numerical comparison digital? Analogical and symbolic effects in two-digit number comparison. *Journal of Experimental Psychology: Human Perception and Performance*, 16(3), 626.
- Geary, D. C. (2004). Mathematics and learning disabilities. *Journal of learning disabilities*, 37(1), 4-15.
- Gilmore, C. K., McCarthy, S. E., & Spelke, E. S. (2010). Non-symbolic arithmetic abilities and mathematics achievement in the first year of formal schooling. *Cognition*, 115(3), 394-406. doi: 10.1016/j.cognition.2010.02.002
- Girelli, L., Lucangeli, D., & Butterworth, B. (2000). The Development of Automaticity in Accessing Number Magnitude. *Journal of experimental child psychology*, 76(2), 104-122. doi: <http://dx.doi.org/10.1006/jecp.2000.2564>
- Holloway, I.D., & Ansari, D. (2009). Mapping numerical magnitudes onto symbols: the numerical distance effect and individual differences in children's mathematics achievement. [Research Support, Non-U.S. Gov't Research Support, U.S. Gov't, Non-P.H.S.]. *Journal of Experimental Child Psychology*, 103(1), 17-29. doi: 10.1016/j.jecp.2008.04.001
- Iuculano, T., Tang, J., Hall, C. W., & Butterworth, B. (2008). Core information processing deficits in developmental dyscalculia and low numeracy. [Research Support, Non-U.S. Gov't]. *Developmental Science*, 11(5), 669-680. doi: 10.1111/j.1467-7687.2008.00716.x
- Olkun, S., Altun, A., Gocer Sahin, S. ve Akkurt Denizli, Z. (2015). Deficits in Basic Number Competencies May Cause Low Numeracy in Primary School Children. *Education & Science*, 40(177), 141-159.
- Rubinsten, O., & Henik, A. (2006). Double dissociation of functions in developmental dyslexia and dyscalculia. *Journal of Educational Psychology*, 98(4), 854.
- Sasanguie, D., De Smedt, B., Defever, E. and Reynvoet, B. (2012). Association between basic numerical abilities and mathematics achievement. *British Journal of Developmental Psychology* (2012), 30, 344–357

Application of Virtual Reality Learning Environment to Enhance Graduate Student's Self-Directed Learning Skill

Nattaphon RAMPAI

*Department of Educational Technology Faculty of Education,
Kasetsart University, Bangkok, Thailand
nattaphon.r@ku.th*

ABSTRACT

Higher Education learning is the top of Professional Learning Community Development, in particular graduate education learning. This research focus to study the application of Virtual Reality Learning Environment to enhanced graduate student's self-directed learning skill that divided into 2 stages: first stage is to develop the appropriate virtual reality learning environment; second stage is to study graduated student's self-directed learning skill. The participants were master degree students that study in Department of Educational Technology, Faculty of Education, Kasetsart University in 2016 academic year. Research tools were: matrix analysis data form, satisfaction questionnaire, and self-directed learning skill test. Data were analyzed by arithmetic mean and Standard Deviation. Research findings revealed that: 1) the virtual reality learning environment: case study on Second Life (virtual world) showed media quality evaluation by 3 experts at "appropriated level", and 2) the 37 graduated students' self-directed learning skill showed at high level that mean the "virtual reality learning environment- prototype" can be use and apply into the learning activity, and finally guide for the policy maker to promote the professionals for design and evaluate educationally informed and empirically grounded learning environments, products, and programs that effectively employ emergent technologies in a variety of settings in the next future.

INTRODUCTION

Educational and communication technology shaped the facilities and services of teacher and learner. Especially in, the way of teaching and learning, the way of sharing experiences has been changed. ICT becomes integral of our lives and it promises opportunity for learners to gain equality in education within diverse contexts and services. The needs for ICT skills professional development that can meet today's educators' demanding schedules, that uses quality content and resources that are available to teachers from any place and any time, and that can deliver relevant, accessible, and ongoing support has stimulated the development of online teacher professional development programs. Online teacher professional development programs make it possible for educators to communicate, share knowledge and resources, and reflect via asynchronous interactions. Moreover, Rabah (2015) suggests that the benefits and challenges of ICT integration is a powerful and flexible tool for learning, it is needed and desired to meet globalization challenges in particular knowledge and communication breakthroughs that the world can achieve using information communication technologies (ICT) are so numerous that educational institutions are striving to invest in ICT tools in an attempt to help raise citizens who are ready to face the challenges of the 21st century where media, manufacturing industries as well as commerce have become increasingly technology-oriented. In addition, Srifa (2016) supports that the teachers must have a good attitude towards the use of new technologies and the ability to use VR technology as well. Technological advancements today have passed beyond cables and wires where the means of communication now can be done from just about anywhere. Office works can be done from home, meetings can be conducted virtually and educational classes can be handled from thousands of miles away without having to have the students to sit in front of their teachers in the same classrooms. However, there is a concern recently that such technological advancements would not be possible to be continued without the sufficient supplies of human capitals. Most of educators can seamlessly enhance learning materials with digital content and students can participate interactively with smart devices and applications to tracking textbooks or digital materials that come to life (Srifa, 2016). Along with the lack of pedagogy skills that is not match in the actual practical needs for higher education. Moreover Sompong, N. et al. (2016) have suggests that the teacher readiness on project-based blended learning including face to face and online learning were mostly possible in their office and home. In addition, the concept of social media that based on the appropriate tool and the medium to deliver knowledge, and helps learners can communicated with each other (Catherall, 2008) especially in teaching and learning using the potential of internet network to access with various sources of learning (Bellegem, 2011).

The main purpose of this study is this research aims to study the application of virtual reality learning environment to enhanced graduate student's self-directed learning skill. The question then becomes, "How to design and develop the Virtual Reality Learning Environment to enhanced graduate student's self-directed learning skill". The expected benefits are the appropriate practices that is the systematic approach to enhance graduated students in 21st century skills. More over the results of quality assessment can be apply the body of knowledge to develop the learning skill of graduated students. In addition, the results can be the information to support the higher education systems policy maker and promote the professionals for design and evaluate educationally informed and empirically grounded learning environments, products, and programs that effectively employ emergent technologies in a variety of settings.

THE STUDY

This research aims to this research aims to study the application of virtual reality learning environment to enhanced graduate student's self-directed learning skill that divided into 2 stages: first stage is to develop the appropriate virtual reality learning environment; second stage is to study graduated student's self-directed learning skill. The methodology provide into 2 phases, the details are as following:

Firstly phase, focusing to develop the appropriate virtual reality learning environment.

1. Analyzing the elements of Online Learning Environments: OLEs and Virtual Learning Environments: VLEs and Self-Directed Learning.
2. Integrating the elements of Virtual Reality Learning Environment.
3. Developing the Virtual Reality Learning Environment: Second Life and quality evaluated by the 3 experts (Educational technology and Knowledge Management field).
4. Studying the appropriate quality of Virtual Reality Learning Environment by the 3 experts (Educational technology field)
5. Try-out the Virtual Reality Learning Environment by the 30 graduate students who study in semester, 2016 for study the research tools quality (try-out stage).
6. Preparing the all of research tools that using in the next step.

Finally, second phase, evaluating graduated student's self-directed learning skill.

1. Research design by following the One-Group Posttest Design.
2. Population and samples:
 - 2.1 Population are the graduate students who study in semester, 2016 academic year at Faculty of Education, Kasetsart University.
 - 2.2 Samples are 37 graduate students that collected by random sampling technique and learn by the virtual reality learning environment.
3. Research tools:
 - 3.1 The Virtual Reality Learning Environment: Second Life.
 - 3.2 The graduate student's self-directed learning skill test.
4. Data analysis:
 - 4.1 Descriptive statistics were Arithmetic Mean and Standard Deviation (S.D.) are used to describe the basic features of the quantitative data.
 - 4.2 Qualitative data were analyzed by category group and issuing data technique.

FINDINGS

1. The Virtual Reality Learning Environment was appropriated with the criterion of media development, details are follows;

- 1.1 Immersive Teaching: Engage students in fun, interactive 3D environments



Fig 1: The Virtual Reality Learning Environment: In front of site gate.

Relationships in virtual worlds have an added dimension compared to other social media, because avatars give a feeling of proximity making the voyeur experience more intense than simply a textual encounter. The complexities of those encounters depend on the engagement levels of the people behind the avatars, whether they are engaging Disassociatively (entertainment only), Immersively (as if the avatar was them), or Augmentatively (meaning they engage for a real-life purpose) (Clift, Pamala, 2012).

1.2 Help desk: Find helpful information on how to get started in Second Life including FAQs, pricing, security, and more.



Fig 2: The Virtual Reality Learning Environment: Information desk.

1.3 Real-Time Collaboration: Collaborate, teach, and create together using voice and text.



Fig 3: The Virtual Reality Learning Environment: Lecturer room I.

Second Life can be a real-time, immersive social space for people including those with physical or mental disabilities that impair their first lives, who often find comfort and security interacting through anonymous avatars. (Indeed, some academics believe using Second Life might even help improve motor ability for people with

1.4 Forums: Join the conversation in the official Second Life forums.



Fig 4: The Virtual Reality Learning Environment: The auditorium.

The Second Life consists of two interrelated phenomena: (i) telepresence: the sense of being there, and (ii) social presence: the sense of being together with others. In the context of virtual worlds, telepresence or the degree of immersion and engagement in the computer-mediated space is achieved through communicators' interaction with their avatar, and social presence through their interaction with others as an avatar.

1.5 Ask the Community: Get answers to the questions from others in the community.



Fig 5: The Virtual Reality Learning Environment: Hall of fame room.

Avatars are technological artifacts that provide communicators a body in virtual spaces. It is through this affordance of embodiment that people, places and things are made concrete, tangible, and present.

1.6 A powerful platform for creativity: Everything in Second Life – interactive 3D objects, unique experiences, global communities, and more



Fig 6: The Virtual Reality Learning Environment: Hall of fame room.

The Virtual Reality Learning Environment: Second Life avatar-self relationship was also studied via resident interviews, and various enactments of the avatar-self relationship were identified. The study concluded that *SL* residents enacted multiple avatar-self relationships and cycled through them in quick succession, suggesting that these avatar-self relationships might be shaped and activated strategically to achieve the desired educational, commercial, or therapeutic outcomes (Schultze, U.; Leahy, M.N. (2009).

2. The quality of the Virtual Reality Learning Environment by the 3 experts opinion was appropriated with instructional media that showed overall results quality at highest level (mean=4.50, S.D.= 0.45), details are following: the highest level showed at the learning environments (mean=4.54, S.D.= 0.35), the learning and teaching components (mean= 4.50, S.D.= 0.43), the learning and teaching promotion (mean= 4.49, S.D.= 0.51), and the structure and architecture design (mean=4.47, S.D.= 0.50). Totally, the Virtual Reality Learning Environment can support the student to learn and enhance their self-directed learning skill on the next steps, details see on table 1

Table 1: the quality of the model

Quality issue	Arithmetic Mean (5.00)	Standard Deviation (S.D.)	Level
the learning and teaching components	4.50	0.43	highest
the structure and architecture design	4.47	0.50	high
the learning environments	4.54	0.35	highest
the learning and teaching promotion	4.49	0.51	high
the overall results quality	4.50	0.45	highest

3. The evaluation of graduate student's self-directed learning skill.

3.1 The graduate student's self-directed learning skill showed overall results at highest level (arithmetic mean=3.51/4.00), details are following: 1) the quality of product especially in appropriately design step (arithmetic mean=3.56/4.00), the quality of product especially in continue design step (arithmetic mean= 3.52), and the quality of creatively product especially in new technique/methods application (arithmetic mean= 3.44). (See in table 2)

Table 2: The graduate student's self-directed learning skill

ICT skills issue	Arithmetic Mean (4.00)	Level
the quality of product especially in appropriately design step	3.56	highest
the quality of product especially in continue design step	3.52	highest
the quality of creatively product especially in new technique/methods application	3.44	high
the overall results	3.51	highest

3.2 The learner's score of self-directed learning skills showed overall results at highest level (arithmetic mean=4.38, S.D. = 0.11). Totally, the Virtual Reality Learning Environment can support the student to learn and enhance their self-directed learning skill on the next steps.

CONCLUSIONS

Research results exhibited that the Virtual Reality Learning Environment: Second Life was appropriated and fit to the quality of instructional media system design and development principal. Online learning skills development is an emerging trend it is still a "new frontier". Educators around the world experience many demands on their knowledge, time, and professional development. Developing and sustaining an effective online learning community can be challenging even during an era of much technological advancement.

Moreover, developing and sustaining an effective large-scale online community is even more challenging. In addition, professional development has mainly centered on learning processes that involve updating knowledge, yet it has made little headway as a construct that includes both the professional and personal characteristics and working conditions. It has also focused more on developing. Finally, the virtual online learning technologies have the potential to transform the professional development of students; penetrate cultural, discipline, and other barriers; bring educators together to learn, share successes and challenges; and co-construct and transfer learning.

RECOMMENDATIONS

1. Applications to design and development that using web-based instruction for graduate students appropriately which guide the application of the next future to teaching in higher education institutions.
2. Online Learning Environments: OLEs and Virtual Learning Environments: VLEs are important tool to teaching and learning for graduated study.
3. Guidelines to online teaching & learning especially in “Seek & Sense” and “Show & Share” process among learners in the “Community of Interest” and “Community of Practices” for virtual learning Environments design.

ACKNOWLEDGEMENT

This research was supported by Educational Technology Department and Faculty of Education, Kasetsart University, Thailand

REFERENCES

- Belleghem, V. S. (2011), Social Media around the World, 2011. *The report by In Sites Consulting*.
- Catherall, P. (2008). *Delivering E-learning for Information Services in Higher Education*. Oxford, Chandos Publishing.
- Clift, Pamala. (2012) Virgin's Handbook on Virtual Relationships, Chapt.6, (CreateSpace) ISBN 1463666993
- Rabah, J. (2015). Benefits and Challenges of Information and Communication Technologies (ICT) Integration in Québec English Schools, *TOJET: The Turkish Online Journal of Educational Technology* – April 2015, volume 14 issue 2.
- Schultze, U.; Leahy, M.N. (2009). The Avatar-Self Relationship: Enacting Presence in Second Life. *ICIS 2009 Proceedings*. 12
- Sompong, N. et al. (2016). Development of project-based blended elearning courseware model for enhancing teachers' ict skills in 21st century. *TOJET: Turkish Online Journal of Educational Technology*- July 2016, volume 2016, pp 331-334.
- Srifa, P. (2016). Learning and teaching environments by using virtual reality technology. *TOJET: Turkish Online Journal of Educational Technology* - December Special Issue, December 2016, volume 2016, pp 1-5.
- Srifa, P. (2016). Interactive learning by using augmented reality technology: The development of electronic publication course for education in Thailand. *TOJET: Turkish Online Journal of Educational Technology*- July 2016, volume 2016, pp 331-334.

Applying Speech Analysis Software to Linguistic Research: A Case Study on Pause Patterns

Ömer EREN

Gaziantep University

omereren2003@gmail.com

Mehmet KILIÇ

Gaziantep University

mehmet416@gmail.com

Erdoğan BADA

Faculty of Education

Çukurova University

lingbada@gmail.com

ABSTRACT

Studies on linguistics have traditionally focused on written records of grammar. This gives only a partial account for the research in a limited context isolated from the producer. Apart from written output, it would significantly contribute to observe the research from speech records. Thanks to advances in speech analysis technology, it is now possible to carry out linguistic research on speakers' actual speech performance as well. Since speech is a dynamic process involving various contextual factors, integration of speech analysis software enables us to get a visual reflection of vocal action time and silence time in a continuous speech stream. In this study, therefore, we describe how this type of technology has been used in pause determination process in linguistic studies.

Keywords: Pauses, prosody, speech analysis software, linguistics

INTRODUCTION

Rapid developments in technology have been continuously evolving and restructuring our daily life. We live in a world where real and virtual have integrated so well that it is impossible to separate one from the other. Advances in technology can be applied in almost every phase of life from medicine to communication by enabling fast and quick access to information thanks to applications developed for specific areas of research. These applications bring forth renovations that make it possible to analyze large-scale data, which would be impossible to carry out just a few decades ago (Mason, 2006).

Use of technology for educational purposes has a well-established background in academia by researchers from various disciplines of educational institutions all over the world. Most of these studies state positive outcomes when technological tools are integrated into traditional educational contexts (Greenhow, Robelia, & Hughes, 2009; Altay, & Tilfarlioglu, 2012; Eren, 2015; Cinkara, & Arslan, 2017). Especially in language teaching and learning, we can track the evolution of state of the art technologies even back to 1960's. Since then, this transformation has founded a solid base to continue further studies. Web 2.0 tools provide us interactive platforms on which we can create, edit and combine various textual and visual elements conveniently (O'Reilly, 2005).

On the other hand, advances in technology have contributed a lot to linguistic studies as well. Traditionally, researchers have examined one aspect of grammar and focused on outcome or students' errors to figure out generalizations. Linguists can investigate large corpora of written texts by comparing and contrasting cross-linguistic data. For example, British National Corpus (BNC) has more than 100 million samples of written and spoken English in a wide range of contexts (Aston & Burnad, 1998).

Frequencies of the use of some words in relation to other words and contexts might explain a great deal about the nature of actual language use. However, this gives only a partial explanation and isolates actual speech performance from written output. Current developments in speech analysis software help researchers interact with large corpora of audio record easily as well. It is possible to visualize and edit actual speech performance, which allows researchers to pinpoint and measure prosodic features such as stress, pause and intonation.

Speech is a dynamic process and it is not produced in isolation. The flow of speech might not be continuous and gaps might appear during this process. These gaps are called pauses and they regulate understanding for a successful communication. Pauses are like punctuations of speech and they define the location of boundaries in a stream (Richards and Gipe, 1992; Oliveira, 2002; Derman, Bardakçı & Öztürk, 2017). Appropriate utterances of pauses assist speakers in various ways. They help listeners for comprehension and signal syntactic complexity. They might even indicate gender, educational and socio-economic information (Esposito, Marinaro & Palombo, 2004). Since pauses play a significant role in speech production, technological development might contribute significantly to research on pauses. Considering this importance, our study has examined following research questions:

- 1- Does the length of a pause preceding coordinating conjunctions differ from a pause following these conjunctions in read speech?
- 2- Does the length of a pause preceding coordinating conjunctions differ from a pause following these conjunctions in spontaneous speech?

LITERATURE REVIEW

There are many studies about the duration of pauses in speech by native speakers of English and these studies show that the duration of pauses differ between native speakers and non-native speakers of English. The experimental studies in spontaneous speech by Goldman-Eisler (1968) have built up a blueprint for the upcoming research since then. His studies have encouraged researchers to enrich the literature. In his series of experimental studies, Goldman-Eisler determined the minimal cut-off point of 250 milliseconds to consider the silence as a pause. Pauses can be classified as silent pauses and filled pauses. Whereas the former corresponds to the cognitive difficulty of the task involved, the latter reflects affective states such as anxiety. Some pauses are considered as cognitive and others as syntactic. Cognitive pauses are observed in spontaneous speech and syntactic ones are observed in read speech (Goldman-Eisler, 1968; Kılıç, 2013).

Bada (2006) carried out a study by investigating the pausing difference before and after *that* in the use of *that clauses* by both English native speakers and Turkish non-native speakers of English. Findings of this study suggest that while pausing before *that* was measured to be much longer than in the following position in the production of the native speaker group, it was observed to be the opposite with the Turkish group.

While this study examined read speech, another research by Bada and Genç (2008) focused on the differences between pausing preceding and following *to* in both spontaneous and read speech by native English speakers. Results of this research display a significant difference between read and spontaneous speech; while pausing before *to* was observed to be significantly longer than the following position in read speech, it was found to be just the opposite in spontaneous speech.

On the other hand, Genç, Özkan and Bada (2010) carried out an interesting study by examining Obama's G-20 summit speech in terms of the difference between read and spontaneous speech. They examined the pause before and after the *to* particle and the results showed that the pause in read speech was longer than the one in spontaneous speech. Findings of this research correlates with a following study in which Genç, Mavaşoğlu and Bada (2011) examined the differences between pausing preceding and following the *que* particle both in spontaneous and read speech of native speakers of French. Analysis of the data showed that pausing preceding *que* was significantly longer than the following position in read speech.

METHODOLOGY

Participants

Participants of this research included eight undergraduate students studying at a university in Gaziantep province. For each language group, two English speakers who are native in Turkish, Swahili, Hausa and Arabic participated. Table 1 shows demographic information about participants:

Table 1: Demographic information about participants

Students	Mother Tongue	English Level	Other Languages	Background
Turkish 1	Turkish	B1	German A1	City
Turkish 2	Turkish	A2		City
Arabic 1	Arabic	B1	Turkish A2	City
Arabic 2	Arabic	B1	Turkish A1	City
Swahili 1	Swahili, Ivo	B2	Luhya B1	City
Swahili 2	Swahili, Agikuyu	B2	French B1	City
Hausa 1	Hausa, Nupi	B2	Turkish A2	City
Hausa 2	Hausa, Ngizim	B2	Turkish A2	Small town

Speakers of Turkish and Arabic have one mother tongue. However, speakers of Swahili and Hausa have one more tribal language as a mother tongue as well.

Data Collection

For this research, data was collected in two phases. The first phase consisted of data collection for read speech. The researchers prepared texts from three different genres; literary, scientific and newspaper. The inclusion of different text genres is to minimize the effect of the reading pattern which might be specific to a single genre, like story. All these texts included coordinating conjunctions. Students read out these texts and their speech was recorded. For the second phase of this study, the researchers carried out semi-structured interviews. The interview questions were about similarities and differences between students' lives in their home countries and Turkey. This topic was chosen in order to elicit coordinating conjunctions and the interview was recorded.

Data Analysis

In order to pinpoint and measure the length of a pause preceding and following coordinating conjunctions, Praat speech analysis software was used. Findings were analysed by t-tests to see whether there is a statistically significant difference between pauses preceding and following these conjunctions in both read and spontaneous speech. Figure 1 illustrates a screen shot from speech analysis:

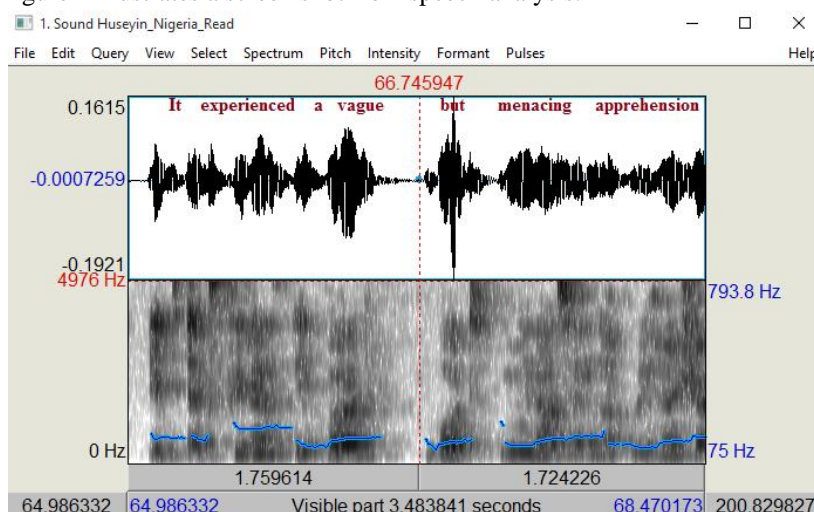


Figure 1: Screen shot from Praat, speech analysis software

FINDINGS

1. Read Speech Results

Findings from Table 2 state that except from Arabic 2 speaker, all students pause longer preceding ‘and’ and ‘but’ conjunctions. However, we can see that in most cases, these pauses are not statistically significant. Only pauses in Arabic 2, Swahili 1, and Hausa 1 speaker records are statistically significant. They have longer pauses following ‘and’ conjunction, compared to other students.

Table 2: Pauses preceding and following ‘and’ and ‘but’

	AND			BUT		
	PP	PF	P	PP	PF	P
Turkish 1	8	8	1.00	19.79	15.61	.675
Turkish 2	21.86	9.33	.118	9.28	6.28	.510
Arabic 1	17.76	4.67	.081	35.30	25.95	.620
Arabic 2	2	13.60	.042	25.28	24.42	.957
Swahili 1	27.20	2.53	.007	22.00	3.85	.113
Swahili 2	13.26	7.93	.428	18.36	8.91	.335
Hausa 1	33.93	3.80	.002	60.42	21.14	.112
Hausa 2	20	14.46	.503	39.83	20.02	.098

($p \leq .05$)

We can infer from Table 3 that only Arabic 1 speaker paused longer in following ‘or’ conjunction, but apart from this instance, in all other cases we can see that speakers pause longer preceding ‘or’ and ‘so’ conjunctions. Except Swahili 2 and Hausa 2 speakers, pauses in other speakers are not statistically significant.

Table 3: Pauses preceding and following ‘or’ and ‘so’

	OR			SO		
	PP	PF	P	PP	PF	P
Turkish 1	12.16	4.66	.318	21.33	3.66	.287
Turkish 2	14.83	4.00	.147	21.66	.33	.340
Arabic 1	13.50	14.66	.945	25.66	13.00	.402
Arabic 2	30.00	5.50	.057	9.33	6.00	.745
Swahili 1	13.66	.1667	.162	8.33	.00	.374
Swahili 2	43.00	.1167	.006	20.33	.00	.092
Hausa 1	36.00	7.00	.090	41.66	.66	.089
Hausa 2	44.50	9.83	.127	69.66	20.33	.032

($p \leq .05$)

2. Spontaneous Speech Results

Interviews were conducted to elicit the coordinating conjunctions in ~~a~~ spontaneous speech. The use of these conjunctions differed in each student. Table 4 shows the number of utterances.

Table 4: Number of utterances in spontaneous speech

	AND	BUT	OR	SO
Turkish 1	10	23	5	3
Turkish 2	13	6	N/A	N/A
Arabic 1	16	8	7	N/A
Arabic 2	8	10	N/A	8
Swahili 1	14	7	2	2
Swahili 2	18	8	5	6
Hausa 1	8	6	N/A	15
Hausa 2	21	8	N/A	9

Analysis of the t-test results shows us the duration of these pauses and whether these pauses are statistically significant. In Table 5, we can see a comparison of this significance level for the coordinating conjunctions in spontaneous speech.

Table 5: Pauses preceding and following coordinating conjunctions

	AND			BUT			OR			SO		
	PP	PF	P	PP	PF	P	PP	PF	P	PP	PF	P
Turkish 1	.03	.19	.052	.15	.07	.030	.00	.00	.016	9.44	.00	.366
Turkish 2	.32	.37	.790	.40	.20	.448	N/A	N/A		N/A	N/A	
Arabic 1	.23	.21	.808	.29	.22	.520	.23	.26	.850	N/A	N/A	
Arabic 2	.50	.10	.001	.42	.23	.245	N/A	N/A		.56	.24	.092
Swahili 1	.65	.00	.000	.33	.06	.006	.19	.00	.423	.14	.07	.405
Swahili 2	.24	.09	.048	.13	.03	.19	.15	.06	.373	.28	.03	.020
Hausa 1	.23	.06	.150	.38	.00	.001	N/A	N/A		.29	.03	.000
Hausa 2	.29	.25	.705	.41	.22	.188	N/A	N/A		.38	.19	.194

($p \leq .05$)

We can see from the findings that in almost all cases, speakers utter a longer pause preceding coordinating conjunctions regardless of their mother tongues. Analysis of t-test results also reflects that Turkish 1, Arabic 2, Swahili 1, Swahili 2 and Hausa 1 utter much longer pauses and these pauses are statistically significant. Pauses in both Swahili speakers are mostly statistically significant.

DISCUSSION

In read speech, we can see that speakers tend to pause longer preceding conjunctions but this duration is not statistically significant in most cases. This might be a result of having a prepared text and not spending time about what to say next in read speech context. Findings from related research also coincide with our findings. In Bada's (2006) study with native speakers of English, we can see that these speakers pause longer in preceding 'that' conjunction. Similarly, in his experimental research with Turkish speakers of English, Kılıç (2013) found that students produced longer pauses in preceding adverbial clause conjunctions. Studies from Bada and Genç (2008) about duration of read speech pauses in to-infinitives and Genç et al. (2011) about the use of *que* clause by native speakers of French also showed a similar pattern.

In spontaneous speech, it can also be observed that speakers pause longer preceding coordinating conjunctions and this duration is statistically significant in most cases. Unlike read speech, this difference might result from the fact that speakers spend more time about planning what they are going to say before producing conjunctions. However, findings regarding spontaneous speech in this study show a different pattern from other studies. In Bada and Genç's (2008) study, native English speakers pause longer following to-infinitives in spontaneous speech and this difference is statistically significant. Another statistically significant difference also occurred following *que* clause in spontaneous speech of native French speakers (Genç et al, 2011).

CONCLUSION

Prosodic features in our speech; such as stress, intonation and pauses are important constituents of effective speech both in reading and speaking. Patterns of pausing preceding and following conjunctions are fixed by innate principles and parameters while speakers acquire their mother tongues. Interlanguage, which is different from speakers' L1, but also different from their L2 (or L3 in some cases) affects the rules that apply to the production of speech. Studies on pausing can help us find underlying patterns that result from the influence of native language. Our speech cannot be isolated from interactions in our environment. Being aware of these patterns, we can detect and if needed, correct these differences to improve speaking skills in diverse classroom contexts (Jarvis & Pavlenko, 2008).

This research is limited with students studying at a university in Gaziantep province and findings cannot be generalised and equated with the patterns resulting from their mother tongues. Therefore, it is advised to conduct this research with more participants in order to get a clearer insight regarding the influence of mother tongue in speakers of English. On the other hand, carrying out this study with native speakers of English would provide an important asset to compare and contrast the pauses from native speaker and non-native speaker perspective.

REFERENCES

- Altay, M. & Tilfarlioglu, F. Y. (2012). Building up a learner corpus through creative nonfiction prose: an experimental research. *Electronic Journal of Social Sciences*, 11(39), 22-35.
- Aston, G., & Burnad, L. (1998). *The BNC Handbook: Exploring The British National Corpus with SARA*. Edinburgh: Edinburg University Press.
- Bada, E. (2006). Pausing preceding and following 'that' in English. *ELT Journal*, 60 (2), 125-132.
- Bada, E., & Genç, B. (2008). Pausing preceding and following to in to-infinitives: A study with implications to reading and speaking skills in ELT. *Journal of Pragmatics*, 40, 1939-1949.
- Boersma, P. (2006). Praat: doing phonetics by computer. <http://www.praat.org/>.
- Cinkara, E., & Arslan, F. Y. (2017). Content Analysis of a Facebook Group as a Form of Mentoring for EFL Teachers. *English Language Teaching*, 10(3), 40-53.
- Derman, S., Bardakçı, M., & Öztürk, M. S. (2017). An investigation of read speech of Arabic students learning Turkish as a second language in terms of stress and pause. *Journal of Language and Linguistic Studies*, 13(1), 215-231.
- Eren, O. (2015). Vocabulary Learning on Learner-Created Content by Using Web 2.0 Tools. *Contemporary Educational Technology*, 6(4), 281-300.
- Esposito, A., Marinaro, M., & Palombo, G. (2004, June). Children speech pauses as markers of different discourse structures and utterance information content. In *Proceedings of the International Conference: From sound to sense* (Vol. 50, pp. 10-13).
- Genç, B., Özkan, Y. & Bada, E. (2010). Pausing preceding and following to in to-infinitives of Obama's G-20 summit speech in London: Read vs spontaneous speech. *International Journal of English and Literature*, 1(2), 16-20.
- Genc, B., Mavasoglu, M., & Bada, E. (2011). Pausing preceding and following que in the production of native speakers of French. *Canadian Journal of Applied Linguistics (CJAL)/Revue canadienne de linguistique appliquée (RCLA)*, 14(1), 144-154.
- Goldman-Eisler, F. (1968). *Psycholinguistics: Experiments in spontaneous speech*. London and New York: Academic Press.
- Greenhow, C., Robelia, B., & Hughes, J. (2009). Learning, teaching, and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, 38, 246–259.
- Jarvis, S., & Pavlenko, A. (2008). *Crosslinguistic influence in language and cognition*. Routledge.
- Kılıç, M. (2013). *Pausing preceding and following adverbial conjunctions in English: A comparative study of Turkish and native speakers of English*. Unpublished doctoral dissertation. Çukurova University, Adana.
- Mason, R. (2006). Learning Technologies for Adult Continuing Education. *Studies in Continuing Education* , 28:2 121-133.
- Oliveira, M. (2002). Pausing strategies as means of information processing in spontaneous narratives. Retrieved April 24, 2013 from <http://www.lpl.univ-aix.fr/sp2002/pdf/oliveira.pdf>.
- O'Reilly, T. (2005). What is Web 2.0: Design patterns and business models for the next generation of software. Retrieved on 1 July 2015 from <http://oreilly.com/web2/archive/what-is-web-20.html>
- Richards, J. C., & Gipe, J. P. (1992). Activating background knowledge: Strategies for beginning and poor readers. *The Reading Teacher*, 45(6), 474-476.

Awareness Integration: A Non-Invasive Recovery Methodology in Reducing College Students' Anxiety, Depression, and Stress

Foojan ZEINE

*Personal Growth Institute, Inc.
Irvine, CA
California, United States*

Nicole JAFARI

*Department of Human Development
California State University, Long Beach
United States*

Mohammad FOROUZESH

*College of Health and Human Services,
California State University, Long Beach
United States*

ABSTRACT

The purpose of this study is to further understand and mitigate stress and anxiety among college students in addition to finding new evidence based approach to address the source of these stressors. College students, predominantly freshmen are subject to stress and stressors (D'Zurilla & Sheedy, 1991), which is due to the transitional college life (Towbes & Cohen, 1996). Students feel the pressure of acquiring a job, establishing a career, and finding a potential life partner. The interaction between all these stressors results in anxiety and tension (Romano, 1992). Awareness Integration (AI) Model (Zeine, 2014) is an effective psychological methodology that utilizes non-invasive and effective techniques to help individuals suffering from multiple stressors overcome anxiety and depression. To test the AI Model, a study was set up at California State University using convenient sampling of subjects recruited on a voluntary basis to participate over the course of 16 weeks during 2015 Fall Semester. A majority of those involved were working on their undergraduate degree and the rest were in a graduate program. More than half of the participants were females between the age ranges of 18 – 24 living on the west coast. Lastly, ethnicity had a strong turnout amongst Caucasian (n =25), Hispanic (n = 51), and Asians (n = 22); nearly half of the subjects appeared to live below the poverty line making less than \$25,000 annually. The researchers' hypothesis is that students' mindfulness of sources of stress, and utilization of emotional releasing techniques will reduce anxiety and depression, increase their coping mechanism, improve their academic performance, and the quality of their relationships both in and the outside of the campus life. The final results showed significant reduction in the areas of anxiety, depression, and stress among the participants, who completed the modules within the period of the semester.

INTRODUCTION

Emerging adults of 18-25 years, such as college students go through developmental stages unique to their abilities, new found autonomy, and social expectations. This period of development differs from adolescence and young adulthood as it tackles cultural identity as well as experiencing independence and role exploration (Arnett, 2000).

College life is one of transition and great deal of change, which leads to students, particularly freshmen to experience stress and negative pressures from external factors (D’Zurilla & Sheedy, 1991). Among the scholars, the interest in how people cope with stress has grown dramatically over the past decade (Moos & Moss, 1986). The starting point for much of this research is the conceptual analysis of stress and coping offered by Lazarus in 1966, who argued that stress consists of three processes. Primary appraisal is the process of perceiving a threat to oneself. Secondary appraisal is the process of bringing to mind a potential response to the threat. Coping is the process of executing that response. Although the interest in such analysis has gained popularity, there is still a need for an efficient psychometric measurement.

Other studies have shown that individual’s negative self-efficacy beliefs could impact choice and task engagement leading to stress and consequently creating anxiety and depression. These beliefs could also limit the degree of determination in task accomplishment (Schunk, 1981; Schunk & Hanson, 1985; Schunk, Hanson, & Cox, 1987). Efficacy beliefs also influence the amount of stress and anxiety individuals experience as they engage in an activity (Pajares & Miller, 1994). As a consequence, self-efficacy beliefs exercise a powerful influence on the level of accomplishment that individuals experience due to the transitional college life. Feeling competent and able to choose the right tasks and successfully completing them is correlated to self efficacy (Towbes & Cohen, 1996).

Awareness Integration (AI) is a new model in the field of psychotherapy, which synthesizes numerous concepts from cognitive, behavioral, emotional, and body-mind theories. AI Model aims to enhance self-awareness, increase self-esteem, release past traumas and psychological blocks, reduce symptoms of anxiety and depression, and promote a clear, realistic, and positive attitude in order to learn and implement new skills for an effective, productive, and functional life. The Awareness Integration Model also uses multiple psychological models to integrates them into an effective method of therapy for all sorts of behaviors, such as addiction, depression, and substance This model allows for release and then integration through flexibly structured questions and expansive interventions that connect core beliefs, emotions, locations in the body where emotions are stored and relevant/original memories.

Due to previous studies confirming college students’ level of anxiety and stress, and to test the viability of AI on college students, a research study was conducted at California State University, Long Beach (CSULB). This study was made possible by a CSULB research grant to develop evidence based data on the applicability and effectiveness of the AI Model on college students and correlation to reducing depression and anxiety. An Institutional Review Board application was also generated and approved by CSULB IRB committee to safeguard the participants’ well being and rights throughout the procedure.

The AI study offered a multi-factorial research exploration; (1) Understand anxiety, depression and stress among college students, (2) Test a new evidence based approach to address the source of these stressors, and (3) To examine a multi-modality, non-invasive self helps psychological model on enhancing self-awareness, releasing past traumas and/or psychological blocks, promoting clarity and positive attitude to learn, and implementing new skills for an effective, productive, and successful Life.

THE MECHANISM OF AWARENESS INTEGRATION PROCESS

Awareness Integration Model is a Multi-Modality Psychological Model that enhances Self-Awareness, releases past traumas and/or psychological blocks, promotes clarity and positive attitude to learn, implements new skills for an effective, productive, and successful Life. This model synthesizes components of already established psychological theories and approaches such as Cognitive Behavioral therapy, Emotion Focused Therapy, Existential Psychotherapy, Person-centered approaches, Attachment theories, Eye Movement Desensitization and Reprocessing (EMDR), Hypnosis, and Mind- Body theories. The Awareness Integration model operates based on 9 principles that have been researched for many years through different theories. 1) Reality of the observer is subjective based on the state of being beliefs, meanings, emotions, and behaviors. 2) The potential to learn skills to have a functional and successful life is available for human being. 3) Skills are learned through physical and psychological development in combination with the mirroring of parents and environment. 4) Perception of the information and experience allows meaning to be assigned and categorization and generalization of the assigned meanings about the self and the world allows a personal identify to be realized. 5) Experiences are stored in memory cognitively, emotionally and somatically. A traumatic experience is compartmentalizing and waits integration to be healed and reintegrated. 6) When the unintegrated belief-emotion-body state is healed and released and integrated, neutral and positive attitude are surfaced. 7) Through the completion of this process, the creation of an intended and conscious choice regarding values, thoughts, feelings, actions and results. 8) Skills can be learned and sustained in a neutral environment toward a desired and intentional result. 9) Conscious and clear vision of a desired result with tangible goal setting, effective planning and efficient action raises the probability of achieving one's desired results (Zeine, 2014).

The goal of this model is to foster awareness and to integrate all split parts of the self from the past into the present, create a vision for the future, create solid goals and action plans with an external feedback loop to ensure a sustainable successful and fulfilled life. The primary method of AI involves identifying one's negative and/or irrational core beliefs, the formulas one has created to operate within one's life, and the identities they have created, sustained and operated. AI will allow for the release of emotional and somatic charges that remain from unintegrated experiences and memories and the dismantling of negative core beliefs. This process assures the integration of the self which will allow skill building and creation of a chosen and intended future to be attainable without the past sabotaging the future. In this research students were directed through the use of a structured set of questions for awareness, and mind-body technique for integration, laid out through six phases. Each phase has its own set of questions and an intent specific to that phase. Clients will be directed through all six phases and explore their relation with different areas of their lives including their school, careers, finances, relationships, families, childhood, themselves, death, God and spirituality, and other significant areas especially related to the student.

Phase I - Phase One is designed to induce awareness of the student's perceptions, emotion, and behaviors in relation to their external environment and how those constructs impact their lives. Every one's identity gets created within relationships. As a child one is born into a marriage, a family, and a culture which immediately feeds the child what is right or wrong. A human being forms the questions in this phase include: What do you think of (people or concepts in an area of life)? How do you feel about (people or concepts in an area of life)? How do you behave towards (people or concepts in an area of life)? How does the way you think, feel, and behave towards (people or concepts in an area of life) affect your and other's life?

Phase II - This phase encompasses three functions: A) To create awareness of the student's projections of others' opinions and feelings about them; B) To enhance the student's ability to observe others' behavior towards them and to observe the meanings the student attributes to that behavior; C) To identify ways in which these constructs impact the student's life. Questions in this phase include: How do you assume people think about you? How do you assume people feel about you? How do you assume or observe people behave toward you? How do your assumptions affect your and other's life?

Phase III - Phase Three aims to foster awareness of student's beliefs, emotions, and behavior about the self in relation to each area of life and considering the identity that interacts towards and responds to various areas of life. Questions in this phase include: As you see yourself among people, looking at them while they're looking at you, what do you think about yourself? How do you feel about yourself? How do you behave towards yourself?

Phase IV - In Phase Four, the student is guided when necessary, in simultaneously experiencing the connection between thoughts, formulas, and schemas with emotions and the body areas that maintain and reflect intense emotions. This process becomes necessary when the student finds a negative core belief about the self or the world which holds a heavy emotional charge. In this phase the core belief is linked to the emotion which is stored in the body and the associated memory that initiated the belief and then allow the release of negative core beliefs, hidden intentions, shadows, and emotions locked in the body. This process also allows one to gain awareness of the ability to be with, tolerate, and manage emotions effectively. Questions in this phase include: When you say [negative core belief] how do you feel about yourself? How do you feel when you say this to yourself? Where is the feeling in your body? What is the intensity on a scale from 1 to 10? Then the student is guided to focus on their body in the location that the emotion is residing and then to allow the emotion to take the student to the first time he/she experienced this kind of emotion and decided the negative belief system. The student then allows an integration between the adult side of the self which is present now and the past/ young part of the self which is still compartmentalized.

Phase V - In Phase Five the student explores the client's chosen values. A commitment to think, feel, and behave via the intention to actualize a chosen value system brings forth a chosen attitude and a chosen identity to live by. From this new commitment, short and long term goals are identified and scheduled, and tangible action plans are set toward a desired outcome. In this phase the therapist will identify which skills the client has already acquired and which skills need improvement.

Phase VI - In Phase Six the student creates a collage of the goals and values as a feedback loop to remind and put in place the context of the values and mission statement that the student has chosen until then goals have been created. Audio feedback loop and or choosing a symbol to use is also helpful if the student does not like to use a collage.

The process of AI is to foster self-awareness from past to present and to integrate the various parts of the 'Self' that have been shattered and separated as a result of psychological trauma. AI offers step by step guidance on how to recognize the broken pieces of one's self, but also to find a way to reunite and reattach all the parts, so that it can once again function effectively and productively. Through this intricate process, the participant recognizes and identifies all the unconstructive thoughts and destructive mental strategies that reside at the core value system of the individual, all the while, help find a way to replace the undesirable thoughts with a positive and more productive principles (Zeine, 2014).

PURPOSE OF THE STUDY

The study is based on a descriptive, micro-genetic model to measure the applicability and effectivity of AI Model on college students aiming to reduce the level of anxiety, stress, and depression. The AI model had been previously studied on two separate occasions with positive results: (a) individuals suffering from depression, and (b) subjects who had gone through divorce or had recently been separated. The first study on individuals was successfully concluded and published in 2014 in the “International Journal of Emergency Mental Health and Human Resilience” indicated a 27.5% decrease in depression, 37% decrease in anxiety, 15% increased self-esteem, and 13% increase in self-efficacy after taking part in AI therapy workshop. A second study on the AI Module published in 2017, in the Mental Health in Family Medicine (2017) yielded 76% decrease in depression, a 60% decrease in anxiety, a 43% increase in self-esteem, and 20% increase in self-efficacy, would be a worthwhile tool to utilize for this population, which as mentioned above, depression, anxiety, and low self-esteem have been a by-product of their divorce. Previous studies having shown successful outcome for AI Model in reducing depression and anxiety, prompted the researchers to test this technique on college students, who suffer from stress due to continually being exposed to deadlines and hectic study schedule leading to depression and anxiety.

METHODOLOGY

This is a descriptive study and the subjects were recruited from the Health Science and the Human Development Departments. As planned, participants were asked to volunteer and sign a consent form if participating. The study also involved recruitment, two hours of training, personal online support, a pretest and posttest survey. Recruitment was the first phase of this project including collection of consent forms. Prior to the study, the university IRB application was submitted for approval. A training session was given, where students were asked to complete a set of psychometric standardized questionnaire on anxiety, stress, and self-efficacy.

The process was followed by each individual filling out a demographics survey and the pretest. The pretest was based on a modification of three different psychometric inventory assessment measuring levels of anxiety, depression, and stress. The Rosenberg self-esteem scale (RSES; Rosenberg, 1965; Blascovich & Tomaka, 1993), The Beck Depression Inventory BDI-II (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) and The Beck Anxiety Inventory (Beck, 1988; Beck & Steer, 1993) were used to create the pre- test and post-test for this study.

Sample Population and Demographic

Subjects were recruited at California State University of Long Beach, from two Health Science and two Human Development upper division classes. The study, a micro-genetic research methodology technique, of a short term data collection duration, took over the course of 16 weeks during 2015 Fall Semester. A majority of those involved were working on their undergraduate degree ($n = 117$) and the rest were in a graduate program ($n = 4$). The average age ranged between 18 – 24 years (82.2%) with a large sum living on the west coast (92.2%). Lastly, ethnicity had a strong turnout amongst Hispanics with 51 participants (39.5%), 25 Caucasian (19.4%), and 22 Asians (17.1%); nearly half of the subjects appeared to live below the poverty line making less than \$25,000 annually ($M = 2.39$, $SD = 2.025$).

DATA ANALYSIS

The pretest and posttest were based on The Rosenberg self-esteem scale (RSES; Rosenberg, 1965; Blascovich & Tomaka, 1993), The Beck Depression Inventory BDI-II (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) and The Beck Anxiety Inventory (Beck, 1988; Beck & Steer, 1993) assessing specific and measurable criteria in the following categories:

- * Questions 1-4 to measure Depression
- * Questions 5-7 to measure Anxiety
- * Questions 8-10 to measure Self-esteem

Once the data were collected, using SPSS software, the research assistants computed the overall results based on participants' response given to each of the fifteen AI Modules selected for this study. The outcome of SPSS analysis yielded in both empirical and descriptive results, which were used in further analysis. Using an excel worksheet, the empirical data was then used to compute the decrease in depression and anxiety. Using the statistical standard mean formula; $(X1+X2+X3+...+ Xn/n) \times 100$ to reflect overall percentages. Accordingly, the standard deviation for each question in each category was calculated to show proof of concept and to ensure a strong confidence level. Based on these calculations, the results showed that there was 68% Overall decrease in Depression and 21.72% Overall decrease in Anxiety as a result of AI psychological model.

EXTRANEOUS VARIABLES

In the course of this research study, the variables of AI Psychological Model and impact on students' degree of depression and stress were measured. However, it is noteworthy to mention other outlier variables may be instrumental in the degree of AI efficiency. It may be possible that each student's temperament, personality, characteristics, and response to adversity should be taken into consideration in the next research study. Also, as the descriptive results showed, gender was shown to be different in response to distress; therefore, the degree of AI success may be dependent on gender orientation. Another element to consider is the timing of pretest and posttest as the time of taking the psychometric may result in different outcome. Other multifactorial elements to be considered as extraneous variables are:

- Demographic
- Ethnicity
- Socio-Economic Status
- Academic performance

It is imperative that extraneous variables to be analyzed and studied to rule out other factors influencing the results.

UNANTICIPATED RESULTS

Participants were mostly from Liberal Arts college, who are predominately females.

Based on Ptacek, Smith, and Dodge (1994) study, there is gender differences in coping mechanism of stress even if the stressors and or appraisals of the stress factors are the same. In the AI study, females significantly chose being less able to relax when compared to males. Also, females were significantly more likely to feel that they were having difficulty breathing when compared to males. Males were also significantly more likely to feel capable of doing things when compared to females and felt more capable of handling unforeseen issues when compared to females.

LITERATURE REVIEW

Due to the transitional college life (Towbes & Cohen, 1996) students particularly freshmen are subject to stress and stressors (D'Zurilla & Sheedy, 1991), Students feel the pressure of acquiring a job, establishing a career, and finding a potential life partner. The interaction between all these stressors results in anxiety and tension (Romano, 1992). Previous research has yielded over 600 articles discussing the importance of addressing the stress of education in medical field, only 24 studies reported intervention programs, and only six of those used rigorous scientific method. Results revealed that medical trainees participating in stress-management programs demonstrated improved immunologic functioning, decreases in depression and anxiety, increased spirituality and empathy, enhanced knowledge of alternative therapies for future referrals, improved knowledge of the effects of stress, greater use of positive coping skills, and the ability to resolve role conflicts. Despite these promising results, the studies had many limitations.

DISCUSSION

Depression affects approximately 14.8 million American adults, or about 6.7 percent of the U.S. population age 18 and older in a given year. Over 80% of the people that have symptoms of clinical depression are not receiving any specific treatment for their depression. The number of patients diagnosed with depression has increased by approximately 20% per year. In the last 12 months, about one-third of U.S. college students have shown difficulty functioning due to depression, and almost half said they felt overwhelming anxiety in the last year, according to the 2013 National College Health Assessment, which examined data from 125,000 students from more than 150 colleges and universities. The anticipated outcome is to better understand and to alleviate stress and anxiety among college students. This is a very important issue among college students across US campuses.

More than 30 percent of students who seek services for mental health issues report that they have seriously considered attempting suicide at some point in their lives, up from about 24 percent in 2010, says Pennsylvania State University psychologist Ben Locke, PhD, who directs the Center for Collegiate Mental Health (CCMH), an organization that gathers college mental health data from more than 263 college and university counseling or mental health centers. The anticipated outcome and goals of this research proposal is to investigate an effective and accelerated method of treating depression, stress related and emotional problems.

A study by Misra, McKean, West & Russo (2000) examined the perceptions of academic stress among male and female college students, and compared the perception of 249 students and 67 faculty members from a mid-western University. Results indicated the existence of stress among college students; however, it also showed a skewed perception of the level of stress among students and the undermining perception by faculty of their stressors.

In another study investigating the sources and levels of stress in relations control and self-esteem in university students showed that 77.6% and 10.4% of the students fall into the moderate and serious stress categories, respectively, and that there were significant differences between females and males' students in both academic and life stress, with female students more stressed than males. This result also encompassed the correlation between control and academic stress meaning students with high self esteem are less stressed than are those with low (Abouserie, 1994).

A separate study consisting of 157 females and 86 males indicated that life satisfaction is positively correlated to less stress both male and female college students with high life satisfaction had more demanding life styles than individuals with low life satisfaction, but they did not suffer greater personal stress. The significant role of fulfilling inter-personal relationships in overall life satisfaction was also evident (Bailey & Miller 1998).

Other studies such as structural equation analysis by (Struthers, Perry, & Menec, 2000) showed that the relationship between college students' academic stress and course grade was influenced by problem-focused coping and motivation but not emotion-focused coping.

Factor analyses of data obtained from 965 graduate and undergraduate students yielded a well-differentiated 11-factor solution of internally consistent and stable scores. The 57-item instrument distinguished between students with high and low stress and was unrelated to students' perceptions of their physical health (Blankstein, Flett, & Koledin, 1991).

Burleson and Goldsmith's (1998) study of 258 participants suggested that verbalizations of positive emotion words in conjunction with reappraisals partially mediated the influence of person-centered comfort on emotional improvement Burleson, B. R., & Goldsmith, D. J. (1998). Furthermore, realizing that a coping mechanism is available when needed will cause the individual to reappraise a threat as less threatening.

As another example, if a coping response is less effective than expected, you may reap- praise the level of threat or reappraise what coping response is appropriate (Carver, Scheier, & Weintraub, 1989). In similar fashion, contemporary motivation theories focus on the cognitive and affective processes that instigate, direct, and sustain human action. Researchers investigate the operation of such processes as goals, expectations, attributions, values, and emotions (Pintrich & Schunk, 1996).

Educational research has yielded inconsistent results on the relation of self-efficacy to persistence. A positive relation may be found in the early stages of learning when greater persistence leads to better performance. As skills develop students should require less time to complete a task, which means that self-efficacy will relate negatively to persistence. With development, children are better able to determine how much persistence may be necessary to succeed. Thus, self-efficacy may predict persistence better at the higher grades. This issue needs to be explored during academic learning. (Schunk, 1995)

Studies have shown that positive attitude is correlated with effective strategies and problem solving and reinterpretation of problems. At the same time, the avoidance technique has been correlated to feelings of hopelessness and negative self worth. Furthermore, maintaining a positive attitude has been correlated with psychological well being. An overall feeling of well being is instrumental in strategizing a problem solving technique that in achieving healthy psychological state in all dimensions (Lazarus & Folkman, 1984).

All research points at the high level of stress among college students and the shortage of quality programs and or psychological models to address these stressors. It has been shown that stress could negatively impact academic performance and quality of life.

Therefore, it is imperative that students are given the tools needed to have a positive college experience and gain access to good quality programs to help ease their stressors and teach them self defense mechanism combating stress.

STUDY LIMITATIONS AND RECOMMENDATIONS

AI psychological model was tested on students in the College of Liberal arts, which is predominately female yielding an imbalance in participants' gender and consequently impacting the results. Therefore, AI Model should be tested on college students in other colleges such as science and computer or film. In addition, the following considerations should be incorporated into future research: Rigorous study design, including randomization and control (comparison) groups, measurement of moderator variables to determine which intervention works best for whom, Specificity of outcome measures, and Follow-up assessment, including effectiveness of future patient care.

UNANTICIPATED RESULT

Study revealed significant differences on how male and females responded to self appraisal questions. Participants in the AI study were mostly from Liberal Arts college, who are predominately females, whom significantly chose moderately less able to relax when compared to males' participants' response on the same relation. Also, females were significantly more likely to feel that they were having difficulty breathing when compared to males. Males were significantly more likely to feel capable of doing things when compared to females, who felt more capable of handling unforeseen issues when compared to females. These differences raise questions such as what are the gender differences in coping mechanism in stressful situation? How does each gender perceive self esteem, self worth, and self perception?

CONCLUSION

The AI experimentation teaches self analysis techniques and self help method for an individual to realize, recognize, address, and take on stressors in life. It also teaches participants how to develop emotional and cognitive mindfulness to better help label and combat such stressors. The overall results in this study show that students develop mindfulness of sources of stress, and learn utilization of emotional releasing techniques to reduce anxiety and depression. The AI treatment also increased their coping mechanism, improved their academic performance, and the quality of their relationships both in and the outside of the campus life. The final results showed significant reduction in the areas of anxiety, depression, and stress among the participants, who completed the modules within the period of the semester. As discussed, studies predominately show the correlation between positive attitude, effective strategies, and problem solving. An overall feeling of well being is instrumental in strategizing a problem solving technique that in achieving healthy psychological state in all dimensions. Self efficacy

REFERENCES

- Abouserie, R. (1994). Sources and levels of stress in relation to locus of control and self-esteem in university students. *Educational Psychology*, 14(3), 323-330
- Arnett, J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469-480
- Bailey, R. C., & Miller, C. (1998). Life satisfaction and life demands in college students. *Social Behavior and Personality*, 26, 51-56
- Beck Depression Inventory BDI-II (Beck, et al., 1961)
- Beck A. T., Steer RA (1993) Beck Anxiety Inventory Manual. San Antonio: Harcourt Brace and Company.
- Beck, A. T., Steer, R.A., & Garbin, M.G. (1988) Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review*, 8(1), 77-100.
- Blankstein, K. R., Flett, G. L., & Koledin, S. (1991). The brief college student hassles scale: Development, validation, and relation with pessimism. *Journal of College Student Development*, 32(3), 258-264
- Burleson, B. R., & Goldsmith, D. J. (1998). How the comforting process works: Alleviating emotional distress through conversationally induced reappraisals. In P. A. Anderson, & L. Guerrero (Eds.), *Handbook of communication and emotion* (pp. 246-281). San Diego: Academic Press
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267-283
- Chang, E. C. (2001). Life stress and depressed mood among adolescents: Examining a cognitive-affective mediation model. *Journal of Social & Clinical Psychology*, 20(3), 416-429
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (pp. 53-55). Hillsdale: Lawrence
- D’Zurilla, T. J., & Sheedy, C. F. (1991). Relation between social problem-solving ability and subsequent level of psychological stress in college students. *Journal of Personality and Social Psychology*, 61(5), 841-846
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer
- Misra, R., McKean, M., West, S., & Russo, T. (2000). Academic stress of college students: Comparison of student and faculty perceptions. *College Student Journal*, 34(2), 236-245
- Moos, R. H., & Moos, B. S. (1986). *Family Environment Scale Manual* (2nd ed.). Palo

- Alto, CA: Consulting Psychologists Press.
- Pajares, F. (1996). Self-efficacy beliefs in achievement settings. *Review of Educational Research*, 66, 543-578.
- Ptacek, J. T., Smith, R. E., & Dodge, K. L. (1994). Gender differences in coping with stress: When stressor and appraisals do not differ. *Personality and Social Psychology Bulletin*, 20(4), 421-430
- Romano, J. L. (1992). Psychoeducational interventions for stress management and well-being. *Journal of Counseling and Development*, 71, 199-202
- Schunk, D. H. (1995). Self-efficacy and education and instruction. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 281-303). New York: Plenum Press.
- Struthers, C. W., Perry, R. P., & Menec, V. H. (2000). An examination of the relationship among academic stress, coping, motivation and performance in college. *Research in Higher Education*, 41(5), 581-592
- Towbes, L. C., & Cohen, L. H. (1996). Chronic stress in the lives of college students: Scale development and prospective prediction of distress. *Journal of Youth and Adolescence*, 25, 199-217
- US National Center for Education Statistics (2005). College enrollment by selected characteristic. Washington, D.C.: US National Center for Education Statistics, Digest of Education Statistics Table 272
- Zeine, F. (2014). Awareness Integration: A New Therapeutic Model, *International Journal of Emergency Mental Health and Human Resilience*, Vol. 16, No. 60-65, pp. ISSN 1522-4821
- Zeine, F., Jafari, N., Haghighatjoo, F. (2017). Awareness Integration: An Alternative Therapeutic Methodology to Reducing Depression, Anxiety, While Improving Low Self-Esteem and Self-Efficacy in Separated or Divorced Individuals, *Mental Health in Family Medicine* (2017) 13: 451-458

Blended E-Learning Acceptance as Smart Pedagogical Tools: An Initial Study in Malaysia

Kung-Teck, WONG

Sultan Idris Education University

Malaysia

Thomas@fppm.upsi.edu.my

Mohd Sahandri Gani HAMZAH

Sultan Idris Education University

Malaysia

Pauline Swee Choo, GOH

Sultan Idris Education University

Malaysia

Mohd Azli b. YEOP

Sultan Idris Education University,

Malaysia

ABSTRACT

The use of technology in classrooms has been considered as the solution to social, economic and educational problems since its introduction to education in mid-1970. There have been many studies conducted on the different aspects of the use of technology in teaching and learning. However, study on teaching with Blended Learning in teaching and learning has not been highlighted especially in Malaysian context. It examines the effects of the exogenous variables towards with use of Blended Learning in teaching and learning among secondary teachers. The proposed research variables are based on previous models of technology acceptance. A total of 98 secondary teachers completed the questionnaire measuring their responses to computer attitudes (CA), computer teaching efficacy (CTE) and school environment (SE) and Blended Learning (BL). Structural Equation Modelling (SEM) was used as the main technique for data analysis. All hypotheses were supported by the data and have direct effects towards Blended Learning use. To sum up, the study provided larger implications for development in theory, practices and policymaking that could be related to the BL use among teachers.

Keywords: Educational technology, structural equation modelling, technology integration

INTRODUCTION

The integration of technologies in classrooms to enhance learning have been highlighted in numerous studies (Wong, Teo & Russo, 2013; Katsamani, Retalis, & Boloudakis, 2012; Lu & Law, 2012). In this regards, Malaysian teachers are expected to integrate technologies in their daily teaching and learning activities. Having that, many Malaysian schools, with the support from related government departments, have devoted considerable resource to technology. Malaysian schools and colleges have included computer technology as an integral part of learning experiences and as a way to equip them with the skills and knowledge necessary to succeed in the 21st century. As the consequence, electronic based teaching tools are becoming increasingly more prevalent in Malaysian classrooms. The Malaysian Ministry of Education (MOE) has highlighted the significance of computer-based technology in schools.

THE STUDY

With the innovation and web-based commercialisation of educational technology, blended e-learning environment has been widely deployed in the teacher institutions throughout Malaysia. Blended e-learning (BL) is the combination of e-learning (synchronous and asynchronous) and traditional way of teaching where it takes the benefits of both practices to create a distinguished instructional. Combination of various methods of practices, teaching tools and media formats is the main criteria in forming the blended e-learning approaches.

Hence, BL is the new way of pedagogical practices that mixes various types of activities to create constructive and interesting learning environments.

There are a number of blended e-learning applications that have become easier to integrate with traditional classroom paradigm. Moodle, Blackboard and WebCT are some of the applications that seem to be bringing beneficial to students who prefer an individualised or less structured environment and optimise the learning effects.

Most of the BL applications could support e-learning activities such as revealing information, notes, quizzes, forum, assignment submission, group chat and assessments. Having such features, BL is not only able to help teachers to deliver learning materials but also at the same time track students' performance and participation.

However, despite the impetus to build blended learning realisations among teachers in higher institutions, integrating and understanding on blended e-learning environment among teachers are in the very beginning level. Many teachers revealed that the opportunity to integrate blended e-learning environment is often severely constrained by the limited information, skills and knowledge that they have gained from teacher education professional development training. Given that, undoubtedly, teachers are dealing with challenges of incorporating traditional and technology as a balance to cater holistic development of students in the newly introduced Standards-based Secondary School Curriculum (KSSM). It is pertinent to point out that in the School Based Assessment (PBS), blended e-learning platform provides room for students to improve their results (band) accordingly based on their own initiative. Teachers could furnish differentiated instructional for diverse students where demonstrated varying degrees of learning style and intelligences. Teacher can design curriculum for those in need as well as those who are ready for new challenges. Furthermore, the integration of technology in teaching and learning has been focused in the new syllabus in teaching under Ministry of Education, Malaysia.

Besides that, many studies in educational technologies have indicated the advantages of integrating blended learning in teaching and learning in developed countries (Escobar-rodriguez & Monge-lozano, 2012; Katsamani, Retalis, & Boloudakis, 2012; Lu & Law, 2012). Escobar-rodriguez & Monge-lozano (2012) and Wong, Goh and Osman (2013) revealed that learners able to achieve higher grades when teachers using technologies in teaching and learning. Indeed, students can learn more skills throughout the integration of BL.

Advocates also noted that, BL teaching and learning tools have become very suitable to encourage collaborative and constructive learning which highly emphasized in today learning styles. Furthermore, based on Malaysian curriculum, many subjects in which educational technologies are frequently employed to achieve the above learning practices.

Given the vital role of BL teaching and learning for in our current Malaysian educational system, and growing concern the vital responsibility of practicing teachers the process of integrating blended learning in schools, time has come to review and examine factors that influence BL acceptance among these teachers.

The findings from this study enable policymakers and educators have a better view and more informed knowledge on the factors that have significant impacts on the use and acceptance of BL. They are more inclined to design programmes that enhance the use of BL among teachers. Thus, the purpose of the study is to explore and understand how far factors such as School Environment, Computer Attitudes and Computer Teaching Efficacy could have significant relationship with BL acceptance in teaching among Malaysian teachers.

RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

Computer Attitudes

Based on literature studies, many establish technology acceptance models have revealed that computer attitude is the significant contribution to the use of technologies in teaching and learning. Theory of Planned Behavior (TPB) (Ajzen, 1985), Technology Acceptance Model (TAM) (Davis, 1989).

Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) are the noted technology acceptance models. TAM, TPB and TRA were based on the relationship of attitude-intention-behavior (actual) constructs. Based on those models and theories, attitudes construct has been the main focus. Ajzen (1975) argued that by understanding an individual's attitude toward an object, one can predict his or her overall pattern of response to the object. An individual's attitude represents an individual's personal convictions and feelings towards a specific object or behavior. Generally, a person who believes that performing a given behavior will lead to positive outcomes will hold a favourable attitude toward performing the behavior. On the other hand, a person who believed that performing a given behavior will lead to negative outcomes will hold an unfavourable attitude toward performing the behavior.

Arising from the technology acceptance models, many studies have been carried out in developing countries and also reveal that computer attitudes have significant correlation with the actual acceptance and use of technology (Liu, Chen, Sun, Wible, & Kuo, 2010; Luan & Teo, 2009; Wong, Osman, Pauline & Khairezan, 2013; Wong, Russo, & McDowall, 2013; Wong, Teo, & Goh, 2014; Wong, Teo, & Russo, 2012). Based the above statement, the following hypothesis was developed.

H1. CA will have a significant influence on BL.

Computer Teaching Efficacy

According to Bandura's social cognitive theory (Bandura, 1977), individual with high self-efficacy will have better ability to cope with roadblocks and endure stress related to change. Conversely, an individual with low self-efficacy will be less likely to attempt innovation or follow through as barriers arise. Many previous researchers, such as Marcinkiewicz (1994), Torkzadeh, Pfulghoeft and Hall (1999), Gibson (2001), Tracey *et al.* (2001), Riggs and Enochs (1990), Bandura (2001), Cassidy and Eachus (2002) and Sugar (2002) have suggested that self-efficacy, by itself, will influence actual performance and practices.

According to the Bandura's theory, there are two dimensions of expectancies of behavior; efficacy beliefs and outcome expectation. Efficacy belief is the feelings of confidence in performing certain task. Outcome expectation was defined as the belief about the consequences that action will produce. Furthermore, other researchers such as Gibson and Dembo (1984) also supported the concept. Given those two dimensions, this study hypothesized that CTE which includes teacher's personal evaluation on their own capability to use computer for teaching (efficacy beliefs) and learning and personal beliefs in using computer as an effective teaching method to improve student's motivation and performance in learning (outcome expectation) have impact on BL use.

H2. CTE will have a significant influence on BL.

School Environment

In this study, school environment refers to the support from administrators, such as non-academic staff, principal and senior assistants and technical support like facility availabilities when adopting computer in teaching and learning process. The study has hypothesized that the higher the support from school environment, the higher the use of computer in teaching and learning. In Goldstein and Ford's (2002) model, the working environment acted as important variable towards actual outcomes. ChanLin, et al. (2006) and ChanLin (2007) noted that the school environment play important role in the use of computer in teaching and learning. Based the above statement, the following hypothesis was developed.

H3. SE will have a significant influence on BL.

METHOD

Research Design

This study intends to understanding BL acceptance among teaching in teaching and learning. Data were collected through using a survey questionnaire comprising questions on demographics and multiple items for each variable in the research model. The survey question composed of 4 constructs. (BL use, school environment, computer attitudes and computer teaching efficacy).

All the participated teachers need to respond to the four point Likert scale questionnaire which consists from strongly agree (4), slightly agree, (3), slightly disagree (2) and strongly disagree (1).

Methodologically, analyses were conducted using AMOS 17 and the usual steps for conducting structural equation modelling (SEM) approach were employed to test the research model with latent variables against the observed data which has the ability to explain relationships among four variables in this study: computer attitudes (CA), computer teaching efficacy (CTE), school environment (SE) and BL use (BL). From the literature, SEM is used widely to predict and explain the determinants of users' acceptance regarding the acceptance of technology in educational settings (Luan & Teo, 2009; Wong et al., 2013).

ANALYSIS AND RESULTS

In this study, two phases analysis have been carried out. A total of 98 teachers in Malaysia involved in this study. The first phase revealed the preliminary analysis which examined the descriptive statistics of the measurement items, and assessed the reliability and validity of the measure used in this study. This was to ensure the data adequate for structural equation modelling testing. For second phase, assessments on the contributions and significance of the latent variables against the observed data and explain its variance with regard to the dependent variable.

Preliminary Analysis

A descriptive analysis was preliminarily carried out on variables involved. Computer attitudes, computer teaching efficacy, school environment and BL use have been identified for their mean and standard deviation (Table 1). From the results, the lowest mean is 2.46 and it is higher than the midpoint score of the data (2.5). Moreover, skew and kurtosis indexed have shown that the data is normal for the analysis of structural equation modelling (Kline, 2005).

Table 1. Descriptive statistics of the study constructs

Construct	Mean	Standard deviation	Skewness	Kurtosis
Computer attitudes	3.63	.48	-1.20	1.12
Computer teaching efficacy	2.12	.66	.02	-.58
School environment	2.37	.94	-.12	-.01
BL use	2.46	.72	-1.09	-1.17

Analysis of Cronbach's alpha was carried out to assess the composite reliability (CR). From the analysis, it proven that all variables loaded accordingly and the index measurement within the acceptable range (0.53 to 0.79) (Table 2).

Table 2. Results for the measurement model

Latent Variable	Item	Factor (>.60)*	Loading	Average Extracted (>.50)*	Variance (= or >.70)*	Composite Reliability (= or >.70)*
Computer Teaching Efficacy	CTE1	.821		.59		.532
	CTE2	.798				
	CTE3	.672				
Computer Attitudes	CA1	.811		.62		.571
	CA2	.781				
	CA3	.772				
School Environment	SE1	.691		.56		.793
	SE2	.835				
	SE3	.722				
BL Use	BL1	.618		.57		.743
	BL2	.818				
	BL3	.811				

^a AVE: Average Variance Extracted is computed by adding the squared factor loadings divided by number of factors.

^b Composite Reliability = $(\sum \lambda^2) / (\sum \lambda^2 + (\sum (1 - \lambda^2)))$.

^c This value was fixed at 1.00 in the model for identification purposes.

*Indicates an acceptance level or validity.

** $p < .01$.

Based on above table, the results of AVE indexes are suitable for testing structural equation modelling as it is around 0.50.

HYPOTHESIS TESTING

Table 3 shows parameter estimates for the significant hypothesized paths. All hypotheses were significant according to the collected data on the relationship between computer attitudes, computer teaching efficacy and school environment toward BL use among practising teachers in Malaysia. Computer teaching efficacy was a significant influence on BL use ($\beta=.19$, $p<.01$) and computer attitudes has a significant influence on BL use ($\beta=.22$ $p<.01$). Finally, BL use was found to be influenced by school environment ($\beta=.63$, $p<.01$).

Table 3. Results of Hypothesis testing

Hypothesis	Relationship	P. C	Finding
H1	CA→BL	0.11**	Supported
H2	CTE→BL	0.18**	Supported
H3	SE→BL	0.60**	Supported

* $p < .05$; ** $p < .01$.

Computer attitudes variable has been indicated as the important factor which influence the use of BL among teachers. Based on the above results, R^2 of the computer attitudes is 0.11. Having that, it proven that computer attitudes variable contributed and explained 11 percent of the variance in the BL use among practicing teachers in Malaysia.

BL use was also significantly determined by computer teaching efficacy and school environment with 18 percent ($R^2 = 0.18$) and 60 ($R^2 = 0.60$) percent respectively. Thus, it has contended that school environment is the most important factor influencing the use of BL in Malaysian schools.

Overall, the combined effects of computer attitudes, computer teaching efficacy and school environment explained 55.9% of the variance of BL use.

DISCUSSION AND IMPLICATIONS

The findings of the study have offered some vital implications in the context of educational technologies especially related to the use of technologies in teaching and learning among practicing teachers.

As anticipated, computer attitudes, computer teaching efficacy and school environment have direct effects towards the levels of integration of BL use in teaching and learning. Together, the variables in the research model in this study explained 55.9% of the variance in BL use among teachers towards BL use in teaching and learning. Overall, the findings have supported existing theories and assumptions that those selected exogenous and endogenous variables affected the BL use among them. Using structural equation modelling, data also indicated that the resulting model was an adequate fit to the observed relationships among the factors that influenced teachers in BL use in teaching and learning.

From the results, it has been corroborated that computer attitudes have positively influenced the use of computer among teachers. Therefore, it goes to show that computer attitude has an important role to play in influencing teachers' use of computers. The finding is in line with previous findings in Western settings. Indeed, from the literature, it appears that many technology studies, conducted in Malaysia setting, have highlighted the importance of computer attitudes in the use of technology (Teo, 2009; Wong, et al., 2013; Wong, et al., 2014; Wong, et al., 2015). Henceforth, in this regard, the Ministry of Education and the related government departments should do more in terms of encouraging positive computer attitudes among practising educators. Furthermore, based on previous findings and the results of this study have indicated that computer attitudes have significant impact on teachers' use of computer in teaching and learning, schools should provide training, funding and support required for this process. By strengthening staff training in technologies, schools can help encourage more positive attitudes toward computers, especially to reduce teachers' anxiety towards computers in general. The school boards of management should ensure that teacher education technology training program to be a part of their yearly activities.

It was also conclusively reported that school environment has very strong impacts on BL use. This is consistent with previous research by ChanLin, et al. (2006) and ChanLin (2007). The significance of school environment in enhancing the use of computer in teaching and learning could be due to the fact that teachers need administrative and technical support to encourage them to use the computer. Teachers need strong and enthusiastic leadership from principal in order to achieve higher confidence and belief in the use of computers. Technical support is vital when teachers are having difficulties in operating the computer based technologies equipment. Having knowledgeable people and willingness to answer questions are critical in overcoming the obstacles of using computer. In the Malaysian schools, especially in the rural areas, lack of availability of computers and software, and incompatibility between the software and hardware are very common situations. The government should inject more financial support and attention to rural schools which with intention to minimize the digital divide between the urban and rural schools. Training for principals is vital in ensuring that they are conscious of the importance of computer in teaching and learning. Through training, they would be able to know how to encourage (giving coaching, feedbacks and leading) teachers to use computers. School districts should look for different funding resources to make computer technologies available for each teacher and in each classroom. Principals or headmasters should give motivation and support to their staff and encourage them to use computers although at the initial level it could be very difficult.

LIMITATIONS OF THE STUDY

Although care has been taken to ensure that the methodology in this study is sound, there are limitations. It is important to state the limitations of the study to frame the above discussions, recommendations and conclusion within its proper context and perspective.

The total numbers of participated teachers in the study were 98. Hence, the findings might not adequately reflect the perceptions of the whole population of Malaysian teachers. Secondly, the questionnaire used in this study may not be able to measure all aspects for the variables concerned. Finally, this study is the timeliness of the data and finding process. At the time of this writing, the data was collected more than a year old. Thus, during this period of time, there may have been some changes in syllabi and curricula in teacher educational training program. However, the main findings of this study will remain true regardless of the aforementioned changes. In the area of inquiries on technology integration among teachers, there is always ample room for additional research. Indeed, more studies should be carried out based on larger sample, so that the results can be more generalized as a whole. Since technology will continue to grow and develop rapidly, a replication of this study might be conducted periodically in order to examine education technology trends. Thus, teacher educational programs would be able to update courses and provide appropriate knowledge and skills for teachers.

ACKNOWLEDGEMENT: Sultan Idris Education University has supported the research. Any errors are the responsibility of the authors and research assistants. This report is the initial findings from the top-down research grant.

REFERENCES

- Ajzen, I. & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. New Jersey: Prentice-Hall.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour. In J. Kuhl, J. Beckmann (eds). *Action Control: from Cognition to Behavior*. New York: Springer Verlag, 11-39.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review*. 84, 191-215.
- Bandura, A. (2001). *The changing face of psychology at the dawning of a globalization era*. *Canadian Psychology*. 42, 12-24.
- Cassidy, S., & Eachus, P. (2002). Developing the BL user self-efficacy (CUSE) scale: Investigating the relationship between computer self-efficacy, gender and experience with computers. *Journal of Educational Computer Research*. 26(2), 133-154.
- ChanLin, L., Hong, J., Horng, T., Chang, S., & Chu, H. (2006). Factor influencing technology integration in teaching: A Taiwanese perspective. *Innovation in Education and Teaching International*. 43(1), 57-68.
- ChanLin, L. H. (2007). Perceived importance and manageability of teachers toward the factors of integrating computer technology into classrooms. *Innovation in Education and Teaching International*. 44(1), 44-55
- Davis, F.D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *Management Information Systems Quarterly*. 13 (3), 983-1003.
- Escobar-Rodriguez, T. & Monge-Lozano, P. (2012). The Acceptance of BL Technology by Business Administration Students. *Computers & Education*, 58(4), 1085-1093.
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading MA: Addison-Wesley.
- Goldstein, I.L., & Ford, K.J. (2002). *Training in Organizations; Needs assessment, development and evaluation*. Belmont, CA: Wadsworth Thomson Learning.
- Gibson, C. (2001). Me and us: differential relationships among goal setting training, efficacy and effectiveness at the individual and team level. *Journal of Organisational Behaviour*. 22, 789-808.
- Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*. 76(4), 503-511.
- Katsamani, M., Retalis, S., & Boloudakis, M. (2012). Designing a BL course with the CADMOS learning design tool. *Educational Media International*, 49 (4), 317-331.
- Kline, R. B. (2005). *Principles and practice of structural equation modelling* (2nd ed.). New York: Guilford Press.
- Liu, I. F., Chen, M.C., Sun, Y.S., Wible, D., & Kuo, C. H. (2010). Extending the TAM model to explore the factors that affect Intention to Use an Online Learning Community. *Computers and Education*, 54(2), 600-610.
- Lu, J. & Law, N. W. (2012). 'Understanding collaborative learning behavior from BL log data'. *Interactive Learning Environments*, 20 (5), 451-466.
- Luan, W. S., & Teo, T. (2009). Investigating the technology acceptance among student teachers in Malaysia: An application of the technology acceptance model (TAM). *Asia-Pacific Education Researcher*, 18 (2), 261-272.
- Marcinkiewicz, H. R. (1994). Computers and teachers: Factors influencing BL use in the classroom. *Journal of Research on Computing in Education*. 26(2), 220-237.
- Riggs, I.M., & Enochs, L.G. (1990). Toward the development of an elementary teacher's Science teaching efficacy belief instrument. *Science Education*. 74(6), 625-637.
- Sugar, W. (2002). Applying human-centred design to technology integration: Three alternative technology perspectives. *Journal of Computing in Teacher Education*. 19(1), 12-17.
- Teo, T. (2009). Modelling technology acceptance in education: A study of pre-service teachers. *Computers & Education*, 52(1), 302-312.
- Torkzadeh, R., Pflughoeft, K., & Hall, L. (1999). Computer self-efficacy, training effectiveness and user attitudes: An empirical study. *Behaviour & Information Technology*. 18(4), 299-309.
- Tracey, J.B., Hinkin, T.R., Tannenbaum, S.I., & Mathieu, J.E. (2001). The influence of individual characteristics and the work environment on varying levels of training outcomes. *Human Resource Development Quarterly*. 12(1), 5-22.

- Wong, K. T., Teo, T., & Russo, S. (2013). Interactive Whiteboard Acceptance: Applicability of the UTAUT Model to Student teachers. *The Asia-Pacific Education Researcher*, 22(1), 1-10.
- Wong, K. T., Teo, T., & Russo, S. (2012). Influence of gender and computer teaching efficacy on computer acceptance among Malaysian student teachers: An extended technology acceptance model. *Australasian Journal of Educational Technology*. 28(7), 1190-1207.
- Wong, K. T., Russo, S., & McDowall, J. (2013). Understanding early childhood student teachers' acceptance and use of interactive whiteboard. *Campus-Wide Information Systems*, 30(1), 4-16.
- Wong, K. T., Osman, R., Pauline, S.C.G, Khairezan, R. (2013). Understanding student teachers' behavioural intention to use technology: Technology Acceptance Model (TAM) validation and testing. *International Journal of Instruction*. 6(1), 89-104.
- Wong, K. T., Pauline, S.C.G., & Osman R. (2013). Affordances of interactive whiteboards and associated pedagogical practices: Perspectives of teachers of science with children aged five to six years. *The Turkish Online Journal of Educational Technology*. 12(1), 1-8.
- Wong, K.T, Teo, T., & Pauline, S.C.G. (2014). Development of the Interactive Whiteboard Acceptance Scale (IWBAS): An Initial Study. *Educational Technology & Society*, 17(4), 268–277.
- Wong, K. T., Teo, T., & Pauline, S.C.G. (2015). Understanding and intention to use interactive whiteboard: Model development and testing. *Interactive Learning Environments*. 23(6), 731-747.

Blended Learning Components Important to Student Learning: A Study on the Perceptions of Instructors

Minh Hien VO

*Department of Educational Sciences,
Vrije Universiteit Brussel,
Pleinlaan 2, 1050, Elsene,
Brussels, Belgium
minh.hien.vo@vub.be
Graduate School,
Can Tho University,
3/2 Street, Ninh Kieu,
Can Tho, Vietnam
vmhien@ctu.edu.vn*

Chang ZHU

*Department of Educational Sciences,
Vrije Universiteit Brussel,
Pleinlaan 2, 1050, Elsene,
Brussels, Belgium
chang.zhu@vub.be*

Nguyet Anh DIEP

*Department of Educational Sciences,
Vrije Universiteit Brussel,
Pleinlaan 2, 1050, Elsene,
Brussels, Belgium
diep.anh.nguyet@vub.be*

ABSTRACT

Blended learning implementation has been extensively examined in literature. Most research questions center around how blended learning results in greater learning achievement, which HAS been measured from a student's perspective. Whilst being recognized as existing in varied models, how blended learning design may be different in hard and soft disciplines is scarcely researched. In addition, the nature of the blends between face-to-face instructions and online learning is not adequately taken into account when discussing blended learning designs. The present study investigated the instructors' perceptions regarding the importance of different components that make up of the blended learning from a multidisciplinary perspective. We also examined if the instructors who implemented different levels blended learning differed in their perceptions. Data ($n=28$) were collected by means of semi-structured interviews accompanied with a questionnaire, which asked for the instructors' rating of each blended learning component. The results showed no significant differences in the rating of the importance of different blended learning components in hard and soft-disciplined instructors. However, two components, namely collaborative facilitation and general communication received significantly higher rating as blended learning was implemented more intensively. Thus, implications for pedagogical practices and research were discussed.

Keywords: blended learning, disciplines, higher education, student learning

INTRODUCTION

Since its introduction and presence in different levels of education, blended learning has been recognized in different models (Zhang & Zhu, 2017). The word blended refers to a mix of face-to-face and online learning aimed at enhanced teaching and learning experiences (Graham, 2006). Consequently, existing models of blended learning place different emphasis. In terms of the organization of the face-to-face and online components, and pedagogy, Graham (2006) proposes three levels of blended learning: enabling blend, enhancing blend, and transforming blend. While the first level manipulates the online component as an enabler of more access, flexibilities, the highest level, i.e. transforming blend requires significant modifications of learning and teaching activities. Later, Adam, Hanesiak, Owston, Lupshenyuk, and Mills (2009) suggest four levels of blended learning organization. The first level makes use of the online platform as an information and one-way communication channel.

The second level shows some extent of connection between the face-to-face and online activities. The third level emphasizes the importance of online interaction activities in which the learning management system (LMS) plays a more important role in enhancing the learning experience. The fourth level of blended learning is aligned with Graham's transforming blend in which the face-to-face and online components are inseparable.

In a different perspective, Kerres and De Witt (2003) develop the didactical mode for blended learning, which realizes three components: content, construction (individual and cooperative), and communication. The content component is related to how information about the course objectives and materials are presented to the students. Next, the construction component attends to how the instructors help individual students to build up knowledge and facilitate the collaborative works; and finally, the communication component refers to different aspects of instructor-student (one-to-one or one-to-many). While distinguishing three components, it is likely that the three are more related in the sense that they have a common goal of fostering knowledge construction on the part of individual students and students as a group. Based on the blended learning framework proposed by Kerres and De Witt's (2003), in this study, we further elaborate the constituting components to capture more nuances in the process of blended learning design. Accordingly, the content component refers to how the learning content is organized or updated (content organization), how content is presented in classroom and online platform (content presentation) and how learning objectives are clearly presented (Ginns & Ellis, 2009). The construction component reflects how instructors facilitate individual students' learning (personal facilitation) (Ausburn, 2004), how the instructors facilitate the collaboration among the students (collaborative facilitation), and how the instructors provide multiple assessment methods to help students identify and evaluate their learning progress (assessment diversity) (Bangert, 2004). Finally, based on different types of instructors-students communication suggested by Moore (1998) and the Community of Inquiry Framework (Garrison, Anderson, & Archer, 2000), we deconstruct the communication component into general communication from instructors to the students (general communication), instructors-student interaction (one-to-one), instructors' feedback to groups of students (feedback to group), and instructors' facilitation of online discussion (instructor facilitation). It is recognized that the three components of blended learning design reflect the breadth of the different pedagogical strategies used. However, in terms of the intensiveness or the depth of blended learning implementation, the different levels as proposed by Adams et al., (2009) and Graham (2006) are still helpful to examine a particular blended learning mode that is being implemented. Thus, when the intensiveness is low, it is expected that less sub-components are relevant in the pedagogy. Put it in another way, at lower levels of blended learning, the importance of fostering online knowledge construction is less recognized.

The implementation of blended learning can also be different in hard and soft discipline given differences in the accompanied epistemological beliefs and methods of knowledge advancement (Neumann, Parry, & Becher, 2002). A meta-analysis conducted by Vo, Zhu, and Diep (2017) shows that the effect of blended learning in hard disciplines is higher than that in soft disciplines. The explanation can be contingent on the blended learning design that has been tailored to meet these disciplinary requirements. Thus, it is hypothesized that the instructors in hard and soft disciplines may place different degrees of importance to the sub-components of blended learning design.

To better understand how blended learning design can be different in hard and soft disciplines and when certain levels of blending is applied, the following research questions are addressed:

RQ1. How do instructors in different disciplines perceive the importance of different components of blended learning design?

RQ2. To what extent do the perceptions of the importance of different components of blended learning design differ when different levels of blended learning are implemented?

METHODOLOGY

Participants

The participants in this study are instructors from different faculty at a major university in Southern Vietnam. The instructors who were invited to participate in this study were implementing blended learning in their courses. Upon receiving the approval from the rector of the institution, a snowballing approach has been used to recruit the participants.

In total, 28 instructors (14: hard disciplines; 14 soft disciplines) have constituted the sample. The mean age of the participants is 35.62 ($SD = 5.95$). Interestingly the number of male and female instructors was equal, i.e. $n = 14$ for each group. The instructors have an average of 11.11 years of teaching experience, $SD = 5.74$.

Instrument

The present study employed semi-structure interview as the principal method of data collection. First, the researcher and the instructors brainstormed about how the face-to-face and online components were integrated in their courses. Subsequently the researcher and the instructor referred to the different levels of blended learning as suggested by Adams et al. (2009). The instructors were asked to select the appropriate level of blended learning that they thought was being implemented. In total, there was one instructor indicating Level 1, 11 instructors specifying Level 2, 13 instructors specifying Level 3, and three instructors with Level 4. As there was only one instructor at Level 1, we have collapsed Level 1 and 2 into one category, resulting in three levels of blended learning implementation. Accordingly, the newly established Level 1 indicated that the online learning platform functioned as an online learning resource that facilitates the face-to-face activities. Level 2 illustrated that the online collaboration and support were available to facilitate student learning. Level 3 emphasized the indispensable role of online learning activities such that these should result in specific assessable collaborative works and personal learning (Adams et al., 2009)

Subsequently the instructor was given a sheet which contained the ten components on blended learning design grouped into three categories as suggested by Kerres and de Witt (2003) as discussed in the previous section. The instructors gave a rating from 1 to 10 to each component with 1 being not important at all to 10 being the most important.

Data analysis method

First a descriptive analysis was carried to provide a general description of the data. Subsequently, multivariate analyses were conducted to examine the effect of disciplines and levels of blended learning on the instructors' perceptions of the importance of the ten components of blended learning design. Prior to the analyses, the effect of socio-demographics, including age, gender, and years of teaching experiences were also analyzed. Once a significant correlation was found, the variable was included as co-variables in the multivariate model.

RESULTS

Descriptive statistics

After the instructors had specified the level of blended learning they were implementing in their current courses, they rated the importance of different components of blended learning design from 1 to 10. As shown in Table 1, most of the components received rather high rating with the minimum value being 4 and the maximum being 10. Among these, feedback to groups of students received the highest score whereas collaborative facilitation obtained the lowest score.

Table 1: Mean, standard deviations (*SDs*), and range of the ten components of blended learning design

Variables	Range	Mean	<i>SD</i>
Content organization	6-10	8.71	1.12
Course objective presentation	7-10	9.11	0.92
Content presentation	7-10	8.89	0.99
Individual facilitation	6-10	8.64	1.10
Collaborative facilitation	6-10	8.61	1.07
Assessment diversity	4-10	9.07	1.36
General communication	6-10	8.75	1.08
Instructor-student interaction	6-10	9.11	1.03
Feedback to group	6-10	8.82	1.09
Instructors' facilitation	7-10	9.21	0.83

Correlation analysis

A Spearman correlation analysis was conducted to examine the relationship between instructors' age and years of teaching experience with the ten components of blended learning rating. The results showed that the age of the instructors had a positive correlation with course objective presentation ($r_s=.50, p<.01$) and instructors' facilitation ($r_s=.53, p<.01$) respectively. In addition, the instructors' years of teaching experience is positively correlated with course objective presentation ($r_s=.41, p<.05$). The result shows that the instructors' age is highly corrected with their years of teaching experience, $r_s=.83, p<.01$. This is not striking as instructors in the studied institution are normally affiliated with the university since their bachelor graduation. Thus, the higher the age, the higher the years of working experience. To avoid issues of collinearity given the high correlation between age and years of teaching experience, we only select age as the covariate in the multivariable analysis.

Using Wilks' Lambda, there is a significant effect of gender ($\lambda = 0.36, F(10, 17) = 3.01, p<.05$) on the instructors' perceptions across the ten components of blended learning design. Therefore, gender was added in the multivariate analysis subsequently as a covariate.

FINDINGS

RQ1. How do instructors in different disciplines perceive the importance of different components of blended learning design

To answer the research questions, the age and gender of the instructors were entered in the model as the covariates and the disciplines from which the blended courses were categorized as independent variable. Using Wilks' Lambda, there is only significant effect of gender ($\lambda = 0.36, F(10, 15) = 2.68, p<.05$) on the perception of the instructors regarding the importance of different blended learning components. Further univariate analysis of variance shows that male and female instructors differ in their perceptions concerning the importance of instructor-student interaction and feedback to group (work) with $F(1,23) = 6.72, p<.05$ and $F(1,23) = 6.88, p<.05$ as shown in Table 2.

Table 2: Univariate analysis result with gender and disciplines as the independent variables

Independent variable: Gender	F	Hypothesis df	Error df	Partial Eta squared (η^2)
Content organization	0.41	1	24	0.02
Course objective presentation	0.25	1	24	0.01
Content presentation	0.84	1	24	0.03
Personal facilitation	0.95	1	24	0.04
Collaborative facilitation	0.00	1	24	0.00
Assessment diversity	0.44	1	24	0.02
General communication	0.03	1	24	0.00
Instructor-student interaction	6.72*	1	24	0.22
Feedback to group	6.88*	1	24	0.22
Instructors' facilitation	0.58	1	24	0.02
Independent variable: Disciplines	F	Hypothesis df	Error df	Partial Eta squared (η^2)
Content organization	0.00	1	24	0.00
Course objective presentation	0.08	1	24	0.00
Content presentation	0.03	1	24	0.00

Personal facilitation	0.87	1	24	0.04
Collaborative facilitation	0.25	1	24	0.01
Assessment diversity	3.44	1	24	0.13
General communication	0.22	1	24	0.01
Instructor-student interaction	0.09	1	24	0.00
Feedback to group	1.21	1	24	0.05
Instructors' facilitation	0.00	1	24	0.00

Note: * $p < .05$

Descriptive statistics showed that male instructors place more importance than female teachers regarding the two components and that there was an equal number of male and female instructors ($n=7$) in each discipline as revealed in Table 3.

Table 3: Differences regarding the perceptions of male and female instructors regarding instructor-student facilitation and feedback to group

Variables	Male ($n=14$)		Female ($n=14$)	
	Mean	SD	Mean	SD
Instructor-student interaction	9.57	.65	8.64	1.15
Feedback to group	9.29	.91	8.36	1.09

Nevertheless, age and disciplines displayed a non-significant effect with $\lambda = 0.56$, $F(10, 14) = 1.76$, $p > .05$ and $\lambda = 0.73$, $F(10, 14) = 0.52$, $p > .05$, respectively.

RQ2. To what extent do the perceptions of the importance of different components of blended learning design differ when different levels of blended learning are implemented?

As age has been found non-significant in the previous analysis, in answering *RQ2*, only gender and three levels of blended learning were entered in the MANOVA.

The result shows that gender still plays a significant role, $\lambda = 0.36$, $F(10, 15) = 2.70$, $p < .05$. Further also univariate analysis of variance shows that male instructors perceived higher importance of instructor-student interaction and feedback to group (work) than their female counterpart. Yet, the number of male instructors implementing higher level of blended learning (Level 2 and 3, $n=9$) is higher than that of females ($n=7$) and the number of female instructors implementing lower level of blended learning (level 1) is higher than that of males.

Using Wilks' Lambda, there is a non-significant effect of blended learning levels on the instructors' perceptions $\lambda = 0.23$, $F(20, 30) = 1.64$, $p = .10$. However, the result from Roy's statistic shows that the effect is significant $\Theta = 1.67$, $F(10, 16) = 2.68$, $p < .05$. Thus, it is acceptable to conclude a significant effect of blended learning level at the multivariate level. Table 4 shows the univariate analysis regarding the effect of gender and blended learning levels on instructors' perceptions of the importance of different BL components.

Table 4: Univariate analysis results regarding the effects of gender and blended learning levels on instructors' perceptions of the importance of blended learning components

Independent variable: Gender	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	Partial Eta squared (η^2)
Content organization	0.20	1	22	0.01
Course objective presentation	0.10	1	22	0.00
Content presentation	0.80	1	22	0.03
Personal facilitation	0.88	1	22	0.04
Collaborative facilitation	0.32	1	22	0.01
Assessment diversity	0.47	1	22	0.02
General communication	0.08	1	22	0.00
Instructor-student interaction	5.62*	1	22	0.19
Feedback to group	4.88*	1	22	0.17
Instructors' facilitation	0.12	1	22	0.01
Independent variable: Blended learning levels	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	Partial Eta squared (η^2)
Content organization	0.82	1	22	0.06
Course objective presentation	1.41	1	22	0.11
Content presentation	0.37	1	22	0.03
Personal facilitation	0.12	1	22	0.01
Collaborative facilitation	4.66*	1	22	0.28
Assessment diversity	2.78	1	22	0.19
General communication	4.16*	1	22	0.26
Instructor-student interaction	1.06	1	22	0.08
Feedback to group	2.57	1	22	0.18
Instructors' facilitation	1.00	1	22	0.08

Note: * $p < .05$

Post-hoc tests further reveal that the significant difference in the perception of the importance of collaborative collaboration was found between Level 1 and Level 2 of blended learning as illustrated in Figure 1.

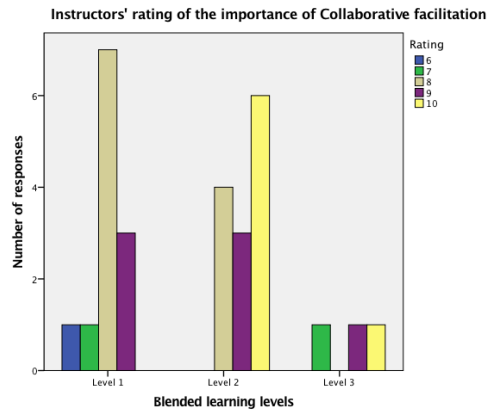


Figure 1: Instructors' rating of the importance of collaborative facilitation regarding student learning

As for general communication, significant differences occurred between Level 1 and Level 2, and between Level 1 and Level 3 of blended learning. Figure 2 graphically displays the differences of rating regarding the importance of general communication between the instructors and the learners in different blended learning levels.

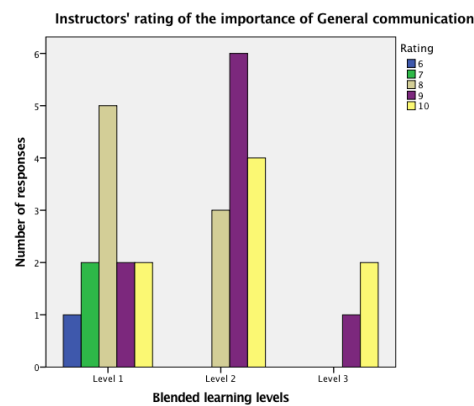


Figure 2: Instructors' rating of the importance of general communication regarding student learning

DISCUSSION AND CONCLUSION

The present study aims to discern the perceptions of the instructors regarding the importance of different components of blended learning design regarding student learning by means of semi-structured interviews accompanied by a quantitative questionnaire. Relevant literature reveals that differences in epistemological beliefs and knowledge development in hard and soft disciplines and the different levels of blended learning implementation may entail differences in the importance of particular blended learning components. We have tested these effects and found that when blended learning was more intensively implemented, i.e. Level 2 and Level 3, the collaborative facilitation and general communication became significantly more important. Nevertheless, instructors in hard and soft disciplines placed the importance of each blended learning component equally, i.e. no significant differences were uncovered. In addition, male and female instructors also rated the importance of instructor-student interaction and feedback to group differently with male instructors having a higher rating.

As for the non-significant effect of disciplines regarding the importance of different blended learning components to student learning, a possible explanation can be that instructors from the two disciplines base their instructional approach towards a more collaborative approach while still paying attention to fostering individual students' knowledge and skill development. This pedagogical objective has been institutionalized in the studied university. Thus, the different components of blended learning design, underpinned by social constructivism (Huang, 2002) while emphasizing personalization manifest in flexibility, conveniences, and prompt feedback harnessed by interactive technologies, have enabled the instructors to better achieve this goal. Therefore, it may be difficult for the instructors to provide a strong opinion regarding the importance of each component due to the overall educational outcomes that drive the pedagogical approaches in each discipline.

When blended learning is implemented at a more intensive level, i.e. the coupling between the face-to-face and online learning becomes more and more inseparable, the role of the instructor facilitation and general communication to students differ among the levels. The findings are in line with the proposition that quality online interaction among the students does not naturally occur without structured guidelines and adequate facilitation (Gašević, Adesope, Joksimović, & Kovanović, 2015; Pelz, 2010). Additionally, when more online interactions and collaborative works are designed, the lack of face-to-face explanation necessitates that a better communication channel between the instructors and the students should be available.

One interesting finding from the study is that male instructors placed more importance to instructor-student interaction and feedback to groups than female instructors. While this can be biased by the fact that the number of male instructors employing higher levels of blended learning is higher as mentioned in the previous section, this should receive attention in future studies or when professional development program in blended learning implementation is designed.

It is acknowledged that the sample size is not adequate to make generalization or to guarantee that a small effect of disciplines and blended learning levels was detected. Thus, replication studies are worthwhile to confirm the findings. In addition, examining the role of these blended learning components from a student perspective and analyzing the results in relation to students' learning achievement are highly recommended to triangulate the results and gain more insights into any discrepancy that is likely to exist between the two main actors, namely the instructors and the students, of the teaching and learning processes.

REFERENCES

- Adams, J., Hanesiak, R. M., Owston, R., Lupshenyuk, D., & Mills, L. (2009). Blended Learning for Soft Skills Development. Institute for Research on Learning Technologies. York University.
- Ausburn, L. J. (2004). Course design elements most valued by adult learners in blended online education environments: An American perspective. *Educational Media International*, 41(4), 327-337.
- Bangert, A. W. (2004). The seven principles of good practice: A framework for evaluating on-line teaching. *The internet and higher education*, 7(3), 217-232.
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105. Garrison, D. R., Anderson, T., & Archer, W. (2001).
- Gašević, D., Adesope, O., Joksimović, S., & Kovanović, V. (2015). Externally-facilitated regulation scaffolding and role assignment to develop cognitive presence in asynchronous online discussions. *The Internet and Higher Education*, 24, 53-65.
- Ginns, P., & Ellis, R. A. (2009). Evaluating the quality of e-learning at the degree level in the student experience of blended learning. *British Journal of Educational Technology*, 40(4), 652-663.
- Graham, C. R. (2006). Blended learning systems. In: D. C. J. Bonk & C. R. Graham. *The handbook of blended learning: Global perspectives, local designs* (pp. 3-21). San Francisco, CA: Pfeiffer.
- Huang, H. M. (2002). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology*, 33(1), 27-37.
- Kerres, M., & Witt, C. D. (2003). A didactical framework for the design of blended learning arrangements. *Journal of Educational Media*, 28(2-3), 101-113.
- Moore (1989). Three types of interaction. *The American Journal of Distance Education*. 3(2), 1-6.
- Neumann, R., Parry, S., & Becher, T. (2002). Teaching and learning in their disciplinary contexts: A conceptual analysis. *Studies in higher education*, 27(4), 405-417.
- Pelz, B. (2010). (My) three principles of effective online pedagogy. *Journal of Asynchronous Learning Networks*, 14(1), 103-116.
- Vo, H. M., Zhu, C., & Diep, N. A. (2017). The effect of blended learning on student performance at course-level in higher education: A meta-analysis. *Studies in Educational Evaluation*, 53, 17-28.
- Zhang, W., & Zhu, C. (2017). Review on Blended Learning: Identifying the Key Themes and Categories. *International Journal of Information and Education Technology*, 7(9), 673.

Comparison of Learning Motivation Affected by Vector Infographic and Bitmap Infographic

Boonjira WONGPA

*Educational Technology Department,
Faculty of Education,
Kasetsart University, Thailand.
tokob@hotmail.com
jfkob@gmail.com*

Sasichaai TANAMAI

*Educational Technology Department
Faculty of Education,
Kasetsart University, Thailand.
sasichaai.t@ku.ac.th
feduwtd@ku.ac.th*

Watsatree DITEEYONT

*Educational Technology Department,
Faculty of Education,
Kasetsart University, Thailand.
sasichaai.t@ku.ac.th
feduwtd@ku.ac.th*

ABSTRACT

The objective of this research was to study the learning motivation affected by infographic using on reading materials focused on Vector infographic and Bitmap infographic. The two-group experimental research design has been applied on the 30 random samples of senior students studied in the 2nd semester of 2016 at the faculty of Industrial Education and Technology in King Mongkut's University of Technology Thonburi. The research revealed that 1) the vector infographic resulted in the excellent level of learning motivation while the bitmap infographic affected in the good level of motivation, 2) the vector infographic influenced the internal learning motivation with the good level while the bitmap infographic showed the moderate level for internal learning motivation for further lessons, 3) the learning motivation level affected by the vector infographic was higher than the bitmap infographic at the significance level of 0.05.

Keywords: Infographic, Vector infographic, Bitmap infographic, Learning Motivation

INTRODUCTION

Motivation is an energizer for conducting a behavior. It directs, continues and sustains behavior such as learning behavior, it directs students moving, points them in a particular direction, and keeps them forwarding. We often see students' motivation reflected in personal investment and in cognitive, emotional, and behavioral engagement in school activities (Fredricks, Blumenfeld, & Paris, 2004; Maehr & Meyer, 2004; Reeve, 2006). A most important learning behavior is reading which expanding students' cognition as a part of cognitive development. Unfortunately, the reading behavior of Thai people tends to decline. A research found an average of 28 minutes per day for reading per day. Similarly, The results of the research by The Publishers and Booksellers Association of Thailand coordinated with Faculty of Economics, Chulalongkorn University and Research Centre for Social and Business Development on Thai people's reading behavior and purchasing books, focusing on reading printed books and e-books after work or study hours only revealed that only 40% of the Thai people read regularly (more than 3 days a week) with the average reading time 46 minutes per day. While 20% of the Thai people read less than 3 days a week and 39.7% never read at all.

Furthermore, they survey about the average time spent reading per day, it was found that Thai people (aged 15-69) spent 28 minutes per days.

Decreasing from the National Statistical Office survey in 2013, Thai people spent 37 minutes per day. For Internet usage and reading hard copy was found that they read the hard copy decreasingly almost half or 41.4% because most people read news on news web. Mostly turned to read news web and the news aggregator. So 2 of 5 respondents accepted that the internet using affect to reading decreasingly.

Based on the results of the PISA 2015 reading assessment, the average reading score for Thai students was 409 (below the OECD average). It is close to Jordan, Brazil, and Albania. Indonesia was the countries in Asia which have lower average score than Thailand. However, Thai students' the top group (at the top of the score 10%) get the reading score 514 points. Thai students' the low group (at the bottom of the score 10%) get the reading score 308 points. Overall, Thai students' the reading score trend drop from PISA 2012 to PISA 2015, the reading scores decreased significantly (32 points). Compared to the core subject reading assessments in PISA 2000 and PISA 2009, the reading scores decreased significantly from 22 points to 12 points. Compared to PISA 2003 and PISA 2006, the scores were not different.

Infographics is the summarized information or knowledge in form of information and graphics that may be lines, symbols, graphs, charts, diagrams, etc., designed as a slide or animation, easy to understand, fast and clear. It can communicate people to understand the meaning of all information without the presenter. Infographics design is an implementation of incomprehensible data or a lot of text to present in various creative forms. There are important elements such as the interesting topics, pictures and sounds, which must be collected enough to summarize, analyze, visualize, attract interest and reducing time to explain. The used graphics may be lines, symbols, graphs, charts, diagrams, maps, etc., it's aesthetic, interesting, clarify, able to remember for a long time and making communication more effective.

The current learning for classroom instruction, the teacher's role is guiding the way for learners to learn by themselves, establishing a knowledge base to summarize the essence content in everyday life. This is appropriate and consistent with the learning motivation that is the process of learning behavior and also the learner's desire to participate in the learning process. That demand is stimulus and control of behavior to learner's goals. Motivation is the most important to learning because of it affects to learning expression and student's learning achievement. Moreover, it is also important for students to help them get through the tough situation about learning. Generally, elements of motivation consists of attention which causes of curiosity about the lesson. Humans have the different needs or motivation endlessly. If anyone try to get something with their extreme desire, it would cause an intensive motivation to success it easily. So that there are several factors which make the motivation such as their personality or nature of desire.

From the results of the PISA 2015 reading assessment in Thai people as mentioned above. It brought to the importance of this problem. Infographics is the summarized information to make reader clear and easy to understand. Moreover, it can help student enjoy reading and get accurate information by designing an infographic between vector infographic and bitmap infographic for enhancing learning and learning motivation. Including the learner is able to achieve their learning objectives. Finally, I hope that the results of this research will be developed in order to solve the problem effectively.

THE STUDY

The main objective of the research was to compare the affect of the using of vector infographic and bitmap infographic on learning motivation. The hypothesizes were set as the vector infographic resulted in the higher level of learning motivation than the bitmap infographic and that the vector infographic might influence in the internal motivation for further learning better than the bitmap infographic.

The two-groups experimental research design was applied on the 30 samplings which were ran domed from 512 senior students studied in the undergraduate's programs at the faculty of Industrial Education and Technology in King Mongkut's University of Technology Thonburi on 2nd semester of 2016 educational year. Then devised them into 2 groups equally.

The content used in this research was the topic 'How to make a good presentation'. Developed based on the principles of ADDIE model for instructional design. (Seals, B. and Glasgow, 1998: 177). Then the 2 different formats of e-books were composed, i.e., vector infographic e-book and bitmap infographic e-book, and have been qualified by 3 specialists. As well as the learning motivation self-assessment was developed to examine the affects of the e-book formats and the influence on the internal learning motivation on further learning.

The experiment began with explaining the sample about the purpose of collecting research data and how to design Infographic between vector infographic and bitmap infographic which affects to learning motivation. Then the researcher described how to design Infographic between vector infographic and bitmap infographic which affects to learning motivation. Including the researcher demonstrated the study approach to the sample. There are two groups, each of them is 15 students (total students is 30). The first group learns from Infographic: vector infographic affects to learning motivation and the second group learns from Infographic: bitmap infographic affects to learning motivation. The design of the graphics. By the way, the study approach is to provide self-directed learning from Infographic between vector infographic and bitmap infographic which affects to learning motivation for 1 hour. After finished the lesson, the samples answered the self-assessment. Then the statistic techniques were applied to interpret the results.

FINDINGS

Part 1 Results of the quality Infographic between vector infographic and bitmap infographic which affects to learning motivation.

Table 1 shows the results of the quality assessment about Infographic between vector infographic and bitmap infographic by 3 specialists.

(n = 3)

The assessment items	1 st person	2 nd person	3 rd person	\bar{x}	Level of quality
1. The vector infographic which affects to learning motivation.					
1.1. Contents					
Mean	4.25	4.75	5.00	4.66	Excellent
1.2. Screen design					
Mean	3.80	5.00	5.00	4.60	Excellent
1.3. Color texts and sound					
Mean	4.00	4.60	4.60	4.40	Good
Total	4.02	4.78	4.86	4.55	Excellent
the assessment items	1 st person	2 nd person	3 rd person	\bar{x}	level of quality
2. The bitmap infographic which affects to learning motivation.					
1.1. Contents					
Mean	4.25	4.5	4.75	4.50	Excellent
1.2. Screen design					
Mean	3.80	4.20	5.00	4.33	Excellent
1.3. Color texts and sound					
Mean	4.00	4.00	4.40	4.13	Good
Total	4.01	4.23	4.72	4.32	Good

From Table 1 found that the content specialist evaluates the quality of Infographic: vector infographic which affects to learning motivation. Total average is 4.55 (Excellent). In the other hand the bitmap infographic which affects to learning motivation. That affects the motivation to learn. Total average is 4.32 (Good). Accordingly, Infographic have quality can be used to experiment with the sample.

Part 2 the results of analysis in student learning motivation on Infographic between vector infographic and bitmap infographic which affects to learning motivation.

Table 2 shows mean, standard deviation, internal motivation in learning of the students which affects to learning motivation.

(n = 30)

The assessment items	\bar{x}	S.D.	Level of learning motivation
1. The vector infographic which affects to learning motivation.			
1.1 An internal motivation	4.56	0.78	Excellent
1.2 An external motivation	4.55	0.72	Excellent
2. The bitmap infographic which affects to learning motivation.			
2.1 An internal motivation	4.08	0.68	Good
2.2 An external motivation	4.06	0.72	Good

From Table 2 found that the vector infographic which affects to learning motivation is "Excellent". Total average is 4.56. An internal motivation is "Excellent" (total average is 4.55). The bitmap infographic which affects to learning motivation is "Good". Total average is 4.08. An external motivation is "Good". (Total average is 4.06)

Part 3 the result of comparing the student's learning motivation score on Infographic between vector infographic and bitmap infographic which affects to internal and external motivation in learning.

Table 3 shows the study about comparison of the student's learning motivation score on Infographic between vector infographic and bitmap infographic which affects to internal and external motivation in learning.

(n = 30)

Mean	\bar{x}	S.D.	t	P
1. The internal motivation in learning.				
1.1 The vector infographic	4.56	0.10	9.01	0.00
1.2 The bitmap infographic	4.08	0.15		
*statistically significant at an alpha level of 0.05				
2. The external motivation in learning.				
2.1 The vector infographic	4.55	0.13	7.03	0.00
2.2 The bitmap infographic	4.06	0.23		
*statistically significant at an alpha level of 0.05				

From Table 3 found that comparing mean of internal motivation in learning, mean of the vector infographic higher than the bitmap infographic significance at .05 level. The external motivation in learning, mean of the vector infographic higher than the bitmap infographic significance at .05 level.

CONCLUSIONS

This research found that Infographic: vector infographics is "Excellent". The average is 4.55 and bitmap infographics is "Good". The average is 4.32 can be used in instruction. As a result of the ADDIE model (Seals, B. and Glasgow, 1998: 177). In the beginning, the researcher studied in background and significance of Thai people's reading behavior, found that Thai people's behavior about reading continues to tend downward. Moreover, the results of the PISA 2015 reading assessment showed that the average reading score for Thai students was 409 (below the OECD average). Infographics is the summarized information or knowledge in form of information and graphics that may be lines, symbols, graphs, charts, diagrams, etc., designed as a slide or animation, easy to understand, fast and clear. It can communicate people to understand the meaning of all information without the presenter. In addition, it was examined from by an advisor and improve the quality Infographic between vector infographic and bitmap infographic which affects to learning motivation. It can be used as the instructional media. By using Infographic that can help students to learn and understand, fast and clear in study. It's similar to Naruemon Thinlunrat (2555) studied in the influence of Infographics on complex information to change it more clear, easy to understand more than communicating by visual texts. The result showed that Infographic can change complicated wording information and related to various information to much more understanding more than communicating by visual texts. Including, people who participated were maximum satisfied and gave positive feedback.

The vector infographic resulted in the excellent level of learning motivation while the bitmap infographic affected in the good level of motivation. And the learning motivation level affected by the vector infographic was higher than the bitmap infographic at the significance level of 0.05. Then the vector infographic influenced the internal learning motivation with the good level while the bitmap infographic showed the moderate level for internal learning motivation for further lessons This comparison of the student's learning motivation score on Infographic between vector infographic and bitmap infographic which affects to internal and external motivation in learning, found that mean of the vector infographic higher than the bitmap infographic significance at .05 level. It is based on the assumptions. It shows that the sample group learned by the Infographic: vector infographic can easily understand, fast and clear. It affected to learning motivation more than bitmap infographic because of vector infographics use mathematical equations as visual construction, combining different types of objects. It can shrink and enlarge in size but the proportion and appearance of the image didn't change. It's suitable for Layout, Line Art or Illustration, all different from bitmap infographics. The bitmap infographics caused by the arrangement of small squares called pixels and stores the specific color values in each position. That process created various images. When the image is enlarged, it will increase small squares and decrease resolution. As well as the studied in an appropriate graphical media for the Learning of Usage of tools in the tool box of Photoshop program for hearing impaired learners: by Sutar Lunggramai (2557). This pilot study is a comparative study between two types of graphics, Step by step - multiple Static Visuals (SSV) and Animated Visual (AV). The result showed that significant difference in both the posttest and the practice score between the two groups in all research tools. This indicates that both types of graphic media help the students to understand easily.

REFERENCES

- Release the PISA Thailand. 2559. Assessment Pisa 2015 math, reading and the Science Compendium For those administration .Institute for the Promotion of Teaching Science and Technology (Release.).Bangkok
- Loyal to preach, 2559. The design of the four graphs (Infographics are Design-) (Online Translate). 29 March 2560
- Sitthichai Laisema, 2014.Knowlwedge Management, Development, and Creative Research. (Online). Retrieved from <https://sites.google.com>,6 Apr, 2559
- Pipat.Chermlab2555. Motivation:FromTheorytoLanguageThailand (Online).<https://www.gotoknow.org/posts/500901>. 4 April 2560
- Pongpant Sopa 2542. Educational Psychology. Bangkok: Development Studies.
- Narumol Tinwirat,2546. Incentives for employee groups company Infonet Thailand.Of New York M.Ed. (Business Studies), New York: Oxford University
- Sutha Luearamai. 2557. Form of visual graph the appropriate learning how to use tools in . The program Photoshop " Journal of the Royal Suda 10 (13): 71-91.
- Sulaug Chotarkoon, 2541. Educational Psychology. Print 3rd Central Bureau of print Chulalongkorn University
- Patira Markup, 2012.Let's Know the Learning Lesson on the Internet. (Online). Retrieved from <https://www.gotoknow.org/posts/366965> , 22 Mar, 2016.

Computer-Based Learning: E-Learning

Bih Ni LEE

*Universiti Malaysia Sabah,
Faculty of Psychology and Education,
Malaysia
leeh_ni@yahoo.com*

ABSTRACT

This article discusses how the computer-based e-learning is useful and practical in life today. Researcher has used a literary narrative research to build the foundation of scientific knowledge. Researcher has collected all the important points in the discussion, and put them in here with reference to the specific areas in which this paper was originally based. The results showed that someone who can not follow conventional education because of various causes, for example time constraint, geographical constraints, physical constraints, limited available seats, phobia of school, dropout, or home schoolers possible to be able to keep learning through e-Learning. Electronic learning (e-Learning) related to meeting with online learning or computer-based learning. In the future the application of Internet technology in the field of education and training will be needed in order to improve quality and equity of educational services, especially in Malay archipelago whose territory is scattered in very remote areas.

Keywords: Electronic Learning, Online Learning, Computer-Based Learning

INTRODUCTION

If a person brings a laptop to a distant place in small isolated island, the person starts to use his laptop and access to various training program materials available. There is no learning support services from tutor or other forms of learning support services. In this context, can the person be said to have implemented e-learning? The answer is NO. Why? This is because he did not get learning assistance services in his learning activities. But what if he has mobile phone and then successfully use it to contact a tutor? Is it in this context that the person has implemented e-Learning? The answer is YES (Newsletter of ODLQC, 2001; Rabiiah, 2008).

The illustration above provides clarity about learning activities that can be said as learning activities based on computer and network or e-Learning. Furthermore, the above description is actually only a small part of the possible benefits we can get when we understand correctly computer applications with the development of information technology that is so globalized recent decades. In subsequent developments the reality shows that computer and network applications are not limited to the manufacture, delivery and data storage only, it allows us to interact directly even at a great distance though. In situations where conditions have been conditioned interactions even can be done not only to one person, but to the entire community of network users. This application we easily see in the virtual world / internet, in other words the development of communication and information technology expressly provides opportunities for application in various fields. In line with the advancement of network technology and the development of the internet, it is possible to apply this technology in various fields including in education or training (Mohamad, Hardhono, et.al, 2017).

In the future the application of Internet technology in the field of education and training will be needed in order to improve quality and equity of educational services, especially in Malay archipelago whose territory is scattered in very remote areas. So it takes the right and fast solution in overcoming various problems which is related to the quality of education, as well as efforts to realize equity acquisition educational services as they are mandated by law (Ana & Elan, 2017).

With the application of distance education based on computer and network (internet, fax, internet-fax etc.) then the dependence will be the distance and time required for the implementation of education and training will be overcome. This is because all that is required will be available online so it can be accessed anytime. In this paper discussed matters relating to the application of internet and network technology for as a form of learning method, by providing some information on the understanding, advantages, disadvantages, as well as some examples of methods related to this computer and network-based learning system.

DISCUSSION

UNDERSTANDING OF LEARNING BASED ON E-LEARNING AND NETWORK

Electronic learning or e-Learning began in the 1970s (Waller and Wilson, 2001). The Concept of Computer-Based Learning and Networking is a form of learning model by utilizing web and internet technologies, the concept of learning and teaching is actually not new, not even new ideas or thoughts, even has developed since a few decades ago. Various terms are used to express opinions / ideas about electronic learning, among others are: on-line learning, internet-enabled learning, virtual learning, or web-based learning, web based distance education, e-Learning, web based teaching and learning. Its development in the world of formal education only occurred in the late 90's.

Globally Concept of Computer-Based Learning and Networking often defined only as e-Learning or Distance Learning. The development of e-Learning concept is characterized by the emergence of sites that serving teaching and learning process based on computer and network since the era of 15 years ago across all corners of the Internet from free or commercial ones.

Canada's education world for example has even begun to apply this system to the world of education, as well as in the emerging American community of e-Learning sites is open to anyone, while in the Malay archipelago of learning using this concept seems still limited applied in Higher Education. Malaysia Science University for example since 1986 has begun to pioneer a form of learning concept which they call as Student Centered Learning (SCL) that enables students to actively explore their understanding of course material. This concept emphasizes on student active learner not teacher active learner (Center of Social Sciences, 1999). From the illustrations excerpted from the Newsletter of ODLQC, 2001 as set forth in the earlier section above, at least can be drawn 3 (three) important thing as requirement of electronic learning activity (e-Learning), that is:

- a. Learning activities are done through network utilization ("Network" in this description is limited to internet usage. Network may include LAN or WAN - in the form of Website eLearners.com)
- b. Availability of support learning services that can be utilized by participants learn, such as a CD-ROM, or printable material, and
- c. The availability of tutor support services that can help participants learn when experiencing difficulties.

In addition to the above three requirements can still be added other requirements, such as:

- d. Institutions that organize / manage e-Learning activities
- e. Positive attitude of learners and educational staff on computer technology and internet
- f. The design of learning systems that can be learned / learned by each participant learns,
- g. The evaluation system on the progress or development of learners' learning, and
- h. The feedback mechanism developed by the organizing agency.

Thus, it can simply be said that electronic learning (e-Learning) is learning activities that utilize the network (Internet, LAN, WAN) as a method of delivery, interaction, and facilitation and supported by various forms of other learning services (Brown, 2000; Feasey, 1998). In further details, the term "e-Learning" or "online learning" will be used interchangeably but still with the same understanding as has been stated.

LEARNING FUNCTIONS BASED ON E-LEARNING AND NETWORKING

There are at least 3 (three) learning functions based on Computer and Network to learning activities in the classroom, namely as an optional supplement, complement, or substitution (Siahaan, 2002).

a. Supplement

It is said to function as a supplement, if learners have freedom of choice, whether to utilize electronic learning materials or not. In this case, there is no obligation / requirement for learners to access electronic learning materials. Although optional, learners who use it will certainly have additional knowledge or insight.

b. Complementary

It is said to function as a complement if electronic learning materials programmed to complement the learning materials received by students in the classroom (Grimsey & Lewis, 2002). As a supplementary means of electronic learning material is programmed to into enrichment or improvement materials for learners in following the conventional learning activities.

Electronic learning materials are said to be enrichment, if to learners who can quickly master / understand subject matter presented by teacher in face to face (fast learners) given the opportunity to access electronic learning materials that were specifically developed for them. The goal is to further strengthen the level of mastery of learners on the subject matter presented by teachers in the classroom (Mark & Fintan, 2001).

Said to be a remedial program, if to learners who have difficulty understanding the subject matter which are presented by teachers in face-to-face classes (slow learners) are given the opportunity to utilize electronic learning materials that are specifically designed for them. The goal is that learners more easily understand the subject matter presented by teachers in the classroom.

c. Substitute

Some schools / colleges in developed countries give some alternative model of learning activities / lectures to the learners. The goal is that learners can flexibly manage lecturing activities in accordance with the time and daily activities of students. There are 3 alternative models of learning activities that can be selected learners, namely:

- a. Fully face-to-face (conventional)
- b. Partly face-to-face and partly via the internet, or
- c. Completely over the internet.

Any alternative learning model that students will choose not a problem in the assessment. Because the three models of lecture material presentation get recognition or the same assessment. If the learner can complete the course and pass through conventional or completely through the internet, or even through the combination of these two models, then the institution of education providers will give the same recognition. This very flexible state is very helpful to the students to accelerate the completion of the lecture.

HOW E-LEARNING IS IMPLEMENTED

The concept of learning by using Computers and Networking enables the process of developing knowledge not only in the classroom where the teacher concentrated in one direction, but with the help of computer and network equipment, students can be actively involved in the teaching and learning process. They can keep in touch with each other anytime and anywhere by way of access to the system available online. Such systems will not only increase the knowledge of all students, but will also help ease the burden of teachers in the teaching-learning process, because in this system some of the functions of teachers can be taken over in a computer program.

In addition, the results of the process and results of teaching and learning can be stored in data in the form of databases, which can be used to repeat the past teaching-learning process as a reference, so that it can be produced a better subject matter content.

As part of the development of e-Learning, web is one of the internet technology that has been growing for a long time and the most commonly used in the implementation of education and training remotely (e-Learning). In general, the application of communication on the internet is divided into 2 types, namely as follows:

a. Synchronous System

Applications that run in real time where all users can communicate at the same time, for example: chat, video conference, and so forth.

b. Asynchronous System

Applications that do not depend on the time at which all users can access the system and communicate between them according to their respective time, for example: e-mail, and so forth.

In the Malay archipelago, even if the development of the beneficiaries of this concept is somewhat sluggish. With network facilities owned by various educational institutions or institutions in Malay archipelago both intranet and internet, is actually very possible to apply web-based e-Learning support systems using synchronous or asynchronous systems, independently or combined, even though basically the two systems above usually combined to produce a more effective system because each has its advantages and disadvantages.

In some countries that have advanced with the condition of high speed network infrastructure will be very enabling the application of multimedia technology in real time like video conferencing for the benefit of e-Learning applications, however for general conditions in Malay archipelago where the network infrastructure is still relatively limited will experience obstacles and become ineffective. However, even without such multimedia technology, actually with the condition of the existing Internet network in Malay archipelago is very possible, especially by using the asynchronous system or by using a synchronous system such as customized chats with an educational support system to be developed.

Some of the institutions of e-Learning organizers can be put forward as follows:

a. University of Phoenix Online is the most successful virtual university in the United States. The University of Phoenix Online has 37,569 students from 78,700 students overall, 38 campuses and 78 learning centers spread across the United States, Canada, and Puerto Rico. In addition, the University has graduated 10,000 temporary students. Other private virtual universities in America are only able to pass far below (Pethokoukis, 2002).

b. Jones International University is one of the most successful universities in organizing e-Learning. The university has 6,000 students who studied online (Pethokoukis, 2002).

c. United Kingdom Open University (UKOU) is the largest university organizer of electronics learning activities in the world with 215,000 students (Daniel, 2000).

d. The College of Business at the University of Tennessee begins e-Learning specific lectures to 400 doctors working in the emergency room across the United States and in 11 other countries. The college that organizes the one-year program for MBA for doctors using e-Learning and face-to-face.

e. Universiti Tun Abdul Razak (UNITAR) is the first university in Malaysia and in Southeast Asia that presents e-lectures (e-Learning). This electronic lecture was started by UNITAR in 1998 (Alhabshi, 2002).

f. The Open University (OU) has conducted an Electronic Tutorial (ET) trial in 1999 for its students. The reason for this electronic tutorial trial is that it meets the needs of students to help them solve the difficulties encountered during self-study (Anggoro, 2001).

g. Universitas Gajah Mada (UGM) has started preparing lessons that utilize the internet for postgraduate programs in hospital management and health services management in 1996 (Prabandari dkk., 1998; Universiti Gajah Mada, 2017).

h. Florida Virtual School is one of the high schools in the United States that has grown rapidly in the provision of electronic learning. In the fifth year, the High School received 3,505 students by employing about 41 full-time teachers and 27 other teachers on a part-time basis. The motto of the school is "anytime, anywhere, through any path, at any speed." (Wildavsky, 2001).

Automation tasks that can be done by utilizing this connection are:

- a. Inclusion of announcement information by instructor
- b. Delivery of lecture files (file uploading)
- c. Authentication of website users

SEVERAL MODELS OF E-LEARNING IMPLEMENTATION

As explained above, e-Learning enables learning not only to take place formally in class, but with the help of computer and network equipment, students can be actively involved in the learning process, in a form of distance learning system without being constrained by geographical, space and time, the following is outlined 2 models of many models of organizing e-Learning in learning:

a. Model of e-Learning tutorial

This model has been applied by the Open University Online, based on the type of communication application that is done can be divided again into two, namely (a). e-Learning Tutorial by utilizing internet e-mail application and (b). Tutorial by utilizing fax-internet application.

i. Electronic tutoring takes advantage of Internet email applications.

Internet-based learning system that can be developed can be a system that utilizes Internet applications called mailing-list. In this tutorial via the Internet teachers will discuss the material or task in writing and then the writing is distributed to all students via email. Then, when students open the Internet and check their e-mail, they can read the teacher's writing and give answers, comments or ask questions about the assigned task (Uno, 2017).

ii. Electronic Tutorial via Fax-Internet

Fax-Internet Integration in the Internet tutoring system will expand the access point for learners. In the Fax-Internet tutorial concept, learners send or receive messages by fax and the teacher / teacher will receive or send the reply by email. When receiving a fax from a learner, the teacher or teacher receives the fax in the form of an attachment on an electronic mail (Mohamad, Hardhono, et.al, 2017).

b. Model Computer Supported Collaboration Learning

Collaboration is defined as cooperation between participants in order to achieve common goals. Collaboration is not just putting the participants into study groups, but also how to coordinate them in order to work together in the study. Related research in the field of collaboration via the Internet known as CSCL (Computer Supported Collaborative Learning), in which CSCL seeks to optimize the knowledge possessed by the participants in the form of cooperation in problem solving. In fact collaboration among participants tends to be easier than collaboration between participants and teachers (Mark & Fintan, 2001).

Users consist of students and teachers who guide, where the students themselves are divided into students and other students who act as collaborators during the learning process. Participants collaborate with tools available through an intranet or internet network, where teachers direct the course of collaboration to achieve the desired goals, as expected, to collaborate among students on problem solving related to the subject matter. This collaboration can be realized in the form of discussion or question and answer by utilizing internet facilities commonly used for example: e-mail, chat, developed in accordance with the needs of the application to be made.

In the implementation of the e-Learning system, collaboration between students will be an essential factor, especially in asynchronous systems where students can not directly know the condition of other students, so if there is a problem in understanding the paper provided, there will be a tendency to fail to follow due to lack of communication between students, resulting in trending tendency in standstill condition, thus causing unexpected results.

There are 5 essential things that must be considered in running the collaboration via the internet, which is as follows:

- a. Clear, positive interdependence among students (Clear / clean, positive interdependence among students)
- b. Regular group self-evaluation (group self-evaluation on a regular basis)

- c. Interpersonal behaviors that promote each member's learning and success (the behavior of personal relationships that promote each success and member lessons)
- d. Individual accountability and personal responsibility (individual responsibility and personal responsibility)
- e. Frequent use of appropriate interpersonal and small group social skills (frequent use of small groups and interpersonal relationships according to social skills)

In the process of collaboration among students, teachers may engage in it indirectly, in order to assist the collaboration process by providing instruction in the form of a message to solve the problem. So hopefully the collaboration process becomes more smoothly.

Some of the tools needed to run the CSCL method are: Database, for storing lesson material and records related to the teaching-learning process, especially the collaboration process. Web Server, is a part of regulating access to the system and set the display that is required in the education process. Including system security settings. Developers like this application can be done using the software as follows:

Platform Open Source Linux
Web Server Apache+Tomcat
Programming Java
Script Java Server Page

Database MySQL / Postgress
Frame Work Struts
Development Tool Eclipse

The advantage of using the above software is entirely an Open Source that can be downloaded for free from their respective web sites, so that in the implementation can be reduced costs as low as possible, without reducing the reliability of the system itself. Another advantage is that access to such systems does not depend on an operating system platform (Romi, 2017).

Therefore, with the implementation of various Open Source Software like this, it is expected to achieve a safe, reliable, high performance, multiplatform, and low cost e-Learning system (Persero, 2017).

Advantages of Utilizing Learning Based on e-learning and Networking

e-Learning facilitates interaction between learners and materials. Likewise the interaction between the learners with the lecturers / teachers / instructors as well as among the learners. Learners can share information or opinions about a variety of things related to the education or self-development needs of learners. Teachers or instructors can place learning materials and tasks that must be done by students in a particular place within the web for access by learners. In accordance with the needs, teachers / instructors can also provide students with the opportunity to access certain learning materials as well as exam questions that can be accessed only once and within a certain time frame (Kudos Website, 2002). In more detail, the benefits of e-Learning can be seen from two angles, namely from the point of the learners and teachers:

a. From the Sudden Participant's Corner

With e-Learning activities it is possible to develop high learning flexibility. That is, learners can access learning materials at all times and repeatedly. Learners can also communicate with teachers / lecturers at any time. With this condition, learners can better strengthen their learning materials.

While infrastructure facilities are not only available in urban areas but have reached the districts and villages, e-Learning activities will benefit (Brown, 2000) to learners who (1) study in small schools in poor areas to follow certain subjects that the school can not provide, (2) follow a home schoolers program to study learning materials that parents can not teach them, such as foreign language and computer skills (Rabiah, 2017), (3) feeling phobia with a school, or a nursery student who is hospitalized or at home, who has dropped out of school but is interested in continuing education, issued by the school, as well as students in various regions or even overseas, and (4) not accommodated in conventional schools to gain education.

b. From the Corner of the Teacher / Lecturer

With the activities of e-Learning (Soekartawi, 2002a, b), some of the benefits of teachers / lecturers / instructors include, among others, that teachers / lecturers / instructors can: (1) more easily update the learning materials that are his responsibilities in accordance with the demands of scientific development, (2) to develop or research to increase its insights because of its relatively free time, (3) controlling the learning activities of the learners. Even teachers / lecturers / instructors can also find out when their learners learn, what topics they are learning, how long a topic is learned, and how many times a particular topic is being re-learned, (4) check whether the learners have done the exercises after studying a particular topic , and (5) examine the answers to the learners and inform the learners.

While the benefits of electronic learning according to A. W. Bates (Bates, 2006) and K. Wulf (Wulf, 1996) consists of 4 things, namely: (1) Increase the level of learning interaction between learners with teachers or instructors (enhance interactivity).

When carefully designed, electronic learning can improve the level of interaction of learning, between learners and teachers / instructors, among learners, and between learners with enhancing interactivity. Unlike the case with conventional learning. Not all learners in conventional learning activities can, be brave or have the opportunity to ask questions or express their opinions in the discussion. Why?

Due to the conventional learning, opportunities available or provided by lecturers / teachers / instructors for discussion or questioning are very limited. Usually this limited opportunity also tends to be dominated by some learners who are quick to respond and dare. Such circumstances will not occur in electronic learning. Shy or undecided or brave learners have ample opportunity to ask questions or submit statements without feeling watched or under pressure from classmates (Loftus, 2001). (2) Enabling learning interaction from where and at any time (time and place flexibility).

Given the learning resources that are already packaged electronically and available for students to access via the Internet, learners can interact with these learning resources anytime and from anywhere (Dowling, 2002). Likewise with the tasks of learning activities, can be submitted to the teacher / lecturer / instructor once completed. No need to wait until there is an appointment to meet with teachers / instructors. Students are not strictly bound with the time and place of organizing learning activities as well as on conventional education.

In this regard, the British Open University has utilized the internet as a method / media of material presentation. While at the Open University of Indonesia (OU), internet use for learning activities has been developed. In the early stages, the use of internet in OU is still limited to tutorial activities only or the so-called "electronic tutorial" (Anggoro, 2001). (3) Reaching students in a wide range (potential to reach a global audience).

With the flexibility of time and place, then the number of learners that can be reached through electronic learning activities more and more widespread.

Space and place and time are no longer an obstacle. Anyone, anywhere, and anytime, someone can learn. Interaction with learning resources is done via the internet. Learning opportunities are truly wide open for anyone in need. (4) Facilitate the refinement and storage of learning materials (easy updating of content as well as archivable capabilities).

The facilities available in internet technology and a growing variety of software help to simplify the development of electronic learning materials. Likewise with the refinement or updating of learning materials in accordance with the demands of scientific material development can be done periodically and easily. In addition, improvements in the method of presentation of learning materials can also be done, either based on feedback from learners and on the results of the assessment of teachers / lecturers / instructors as the responsible person or the constructor of the learning material itself.

Knowledge and skills for the development of electronic learning materials needs to be mastered first by teachers/ lecturers / instructors who will develop electronic learning materials. Likewise with the management of learning activities themselves. There should be a commitment from teachers / lecturers / instructors who will monitor the development of learning activities of students and simultaneously motivate the students, this activity actually leads to efforts to keep controlling the quality of the process itself.

CONCLUSION

If the computer network between primary and secondary school students is linked to a computer network that currently operates between various universities in Indonesia. Learners not only interact with teachers but also directly personally interact with college students and lecturers. What will this relationship gain from? it is clear that the thinking insight of learners will be opened wide with this openness. The learners become aware of why they have to bother studying the various subjects that have been taught. Why is Physics and Mathematics so important to be an electrical and computer engineer? We can expect that this openness will spur the learners to learn and increase his interest in various fields of science.

In line with the definition of e-Learning or electronic learning as an alternative learning activities implemented through the utilization of computer technology and the Internet. A person who can not follow conventional education due to various factors, such as time constraint, geographical constraints, distance constraint, physical constraints, conventional school capacity not available (limited available seats), phobia to school, dropping out of school, or being educated through home schoolers education is possible to keep learning through e-Learning.

The implementation of e-Learning is determined by: (a) positive attitude of learners (high motivation for self-learning), (b) positive attitude of education personnel on computer and internet technology, (c) availability of computer facilities and access to internet, (d) the support of learning services, and (e) affordable access to the internet for learning / education purposes.

Developments in various countries show that the number of internet users is increasing; as well as the number of students who follow e-Learning and e-Learning organizers. The function of e-Learning can be as a complement or additional, and in certain conditions can even be another alternative to conventional learning. Learners who follow the learning activities through e-Learning program have the same recognition with students who follow the learning activities in conventional.

Learners and lecturers / teachers / instructors can benefit from the implementation of e-Learning. Some of the benefits of e-Learning is the flexibility of learning activities, both in the sense of interaction with learners / learning materials, and the interaction of learners with lecturers / teachers / instructors, as well as the interaction between fellow learners to discuss learning materials.

Conventional educational institutions (universities, schools, training institutions, or vocational and advanced courses) have extensively organized expansion of learning opportunities for their 'target audience' through the use of computer and internet technologies (Collier & Thomas, 2002). Along with this, school-age students who follow electronic learning activities also continue to increase in number (Gibbon, 2002).

REFERENCES

- Alhabshi, Syed Othman. (2002). The Use Of ICT In Today's Islamic Business. *Seminar on Islamic Business in Global Era*. Brunei Darussalam: INCEIP Knowledge Repository
- Ana, H. & Elan, D. (2017). e-Learning Support System On The Web. Jakarta: Informatics Institute of Indonesian Science Research Center.
- Anggoro, Linggar. (2001). *Theory and Profession of Public Relations and Applications in Indonesia*. Jakarta: Bumi Aksara.
- Bates, A. W. (2006). The Impact Of Technological Change On Open And Distance Learning. *Taylor & Francis Online*, Jul 28, 2006, 93-106
- Brown, D. H. (2000). Principles of language learning & teaching. (4th ed.). New York: Longman.
- Center of Social Sciences. (1999). *Student Centered Learning*. Penang: Malaysia Science University.
- Collier, V.P., & Thomas, W.P. (2002). Reforming education policies for English learners means better schools for all. *The State Education Standard*, 3(1), 30-36. Alexandria, VA: National Association of State Boards of Education.
- Dowling, C. (2002). Researching agent technologies in the electronic classroom: Some pedagogical issues. In P. Barker & S. A. Rebelsky (Eds.), *Proceeding of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2002*, 437-442. Chesapeake, VA: AACE.
- Daniel, W. (2000). Electronics Learning Activities. UK: UKOU
- Feasey, R. (1998). *Thinking and working scientifically*. In K. Skamp (Ed.), *Teaching primary science constructively*. New South Wales: Harcourt Brace.
- Gibbons, M. (2002). *The Self-Directed Learning Handbook: Challenging Adolescent Students To Excel*. San Francisco, CA: Jossey-Bass.
- Grimsey, D. & Lewis, M.K (2002). Evaluating the risks for public private partnerships for infrastructure projects. *International Journal of Project management*, Vol. 20, pp. 107-118.
- Kudos Website (2002). *Utilizing Learning Based On e-Learning*. UK: Kudos Website Design
- Loftus, E. F. (2001) Imagining the past. *The Psychologist*, Vol 14, No 11, 584-587.
- Mark, A. E. & Fintan, C. (2001). Supporting The Collaborative Learning Of Practical Skills With Computer-Mediated. *Communications Technology, Educational Technology & Society* 4 (1) 2001, ISSN 1436-4522.
- Mohamad, T. A., Hardhono, A.P., Tian, B., & Tri, D. (2017). Tutorial Electronic Through Internet And Fax-Internet. *Journal PTJJ-UT*, Volume 1.2.
- Newsletter of Open and Distance Learning Quality Council (ODLQC). (2001). e-Learning Implementation. United Kingdom: ODLQC
- Persero, U. (2017). Developing Traditional Learning Concept Into e-Learning. Bogor: e-Learning
- Pethokoukis, J. M. (2002). e-Learn And Earn. (2002, June 24). *U.S. News & World Report*, 132 (22).
- Prabandari, et al. 1998. Process Evaluation of An Internet-based Education on Hospital and Health Service Management. A Paper presented in the *4th International Symposium on on Open and Distance Learning*. Yogyakarta: Gajah Mada University
- Rabiah, Adawi. (2017). French Language Studies. *Internet and Education*. Yogyakarta: Foreign Language Studies
- Rabiah Adawi. (2008). e-Learning Based Learning. *Sat Information*, 2008, April-Jun. Medan: Faculty of Languages and Arts, State University of Medan
- Romi, S. W. (2017). New Web Site Management Strategies for Free e-Learning. Jakarta: Satriawahononet
- Siahaan, S. (2002). e-Learning (Electronic Learning) As One Alternative Learning Activity. Jakarta: Depdiknas
- Soekartawi. (2002a). The Prospect of Learning Through the Internet. National Seminar on Technology of Education. Jakarta, 18-19 July 2002. *Open University Pustekkom and Institute Educational Technology Indonesia*.
- Soekartawi. (2002b). e-Learning: Concepts and Applications. *Seminar Balitbang Depdiknas*. Jakarta, December 18, 2002.
- Universiti Gajah Mada. (2017). Utilization Of Internet Morning Improvement Learning. Yogyakarta: Universiti Gajah Mada
- Uno, W. P. (2017). Second National Awakening Based On Information Technology e-Learning, Education Equality Revolution. Jakarta: Arbyn Ungonline.
- Waller, V. dan Wilson, J. (2001). *A Definition of E-Learning*. United Kingdom: ODLQC

Considerations for Implementing Websites with Greater Accessibility for People with Visual Impairment

Carlos Oswaldo URGILES-CEDENO

*Grupo de Investigación y Comunicación web GICOWEB
Universidad Técnica de Machala, Ecuador
curgiles_est@utmachala.edu.ec*

Franklin Alberto CONZA APOLO

*Grupo de Investigación y Comunicación web GICOWEB
Universidad Técnica de Machala, Ecuador
fconza@utmachala.edu.ec*

Jorge MAZA

*Grupo de Investigación y Comunicación web GICOWEB
Universidad Técnica de Machala, Ecuador
jmaza@utmachala.edu.ec, jcelleri@utmachala.edu.ec*

Jennifer Celleri PACHECO

*Grupo de Investigación y Comunicación web GICOWEB
Universidad Técnica de Machala, Ecuador
jcelleri@utmachala.edu.ec*

ABSTRACT

This research selected the main considerations that developers should implement in websites to ensure accessibility for people with visual impairment. This research is based on the systemic analysis of international guidelines and standards, including those presented by the Web Content Accessibility Guidelines (WCAG) 2.0. The WCAG guidelines are the most comprehensive and are used as a de facto standard by several countries worldwide. Since 2016 in Ecuador, the technical standard for accessibility NTE INEN - ISO / IEC 40500 has been implemented for the state's web pages. The new regulations seek that these types of websites comply with at least the first level of accessibility (level A) of the above mentioned guide. The considerations presented in this paper will serve as a guide to best practices for web developers looking to implement accessibility in their sites. The result of this work will be available for free with online access. It must be implemented the web accessibility guidelines does not ensure that a person with multiple disabilities can fully access the content of a site.

INTRODUCTION

People with visual impairment need help to make use of the computer, this help can be of the screen readers, who are responsible for narrating the elements present in the window thus minimizing a little the present difficulty in using this instrument. When navigating within the different programs and windows of the computer the screen readers completely fulfill their purpose, but do not usually work efficiently when dealing with web browsing because the pages of such sites are created from a In the wrong way, many elements are incorporated that make it difficult for the screen readers to work, thus reducing considerably the accessibility factor of the site. It is customary for programmers to develop websites with correct functionality by using all types of content such as images, forms, audio or video so that the site can be accessed, understood and used by end users. Typically, end users are identified as people without any disabilities who can use such content without complications; Thus generating a kind of discrimination against people who, due to a disability, can not access the web content on a regular basis.

This research analyzes the field of web accessibility for people with visual impairment, based on the different international studies on web accessibility in recent years, along with different standards and standards already in force in different countries of the globe to generate as An interactive web guide for web site developers based on W3C standards in its WCAG 2.0 guide. This last one is the guide that the Ecuadorian Government has taken as reference for the creation of its own technical regulation of accessibility of websites.

In the Ecuadorian constitution sections have already been implemented that speak of inclusion for people with disabilities in the different aspects of society, health, work, among others. In its rules of accessibility web, it ensures that the sites that are created from now on are accessible for them, at least in a basic level, it presents the guidelines for the developers to create accessible sites. But despite all of the aforementioned the theme of web accessibility is still a relatively new area of which a very small group of developers are aware, so there is still an extremely high number of pages that are not accessible to The new pages with accessibility that are gradually seeing the light, because they were created from the beginning with this aspect in mind or because of what the law demands, adapting a page that was not previously accessible to the point that it is Accessible at least at a basic level so that it is not removed from the server.

INTRODUCTION

We must take into account that accessibility not only serves a specific group of users, but also helps improve the quality of websites [1] to improve the experience of all users in general, since it is a parameter that determines The degree of ease when accessing or using something especially for those who have a disability [2], as with people with visual impairment, since although they may have blindness or low vision, they may perceive an image presented in a Audiovisual medium through its other senses [3].

It can be said that, in order to achieve web accessibility, two main components must be taken into account. The first is the technical component, which refers to existing standards and guidelines to achieve a level of accessibility in particular, and the second component is the human, which will handle the user experience, from the point of content producer Creating and uploading accessible web content as well as end user [4]. This is speaking in a very superficial way, but some studies already cover web accessibility in several more detailed parameters such as the publication of user-created content, media-user interaction, access to information, versions of the same information available, Among others [5], all these parameters are also created according to the type of website being analyzed.

One of the most widely used standards internationally on web accessibility is the Web Content Accessibility Guidelines (WCAG) in its version 2.0, which is composed of 4 principles, each of them have guidelines and these guidelines in turn have compliance criteria [6]. In addition, to determine accessibility levels according to compliance criteria, there are 3 levels that are: Level A, Level AA and Level AAA [7]. Level A indicates the basic and mandatory level of accessibility, while AA and AAA levels have stricter criteria [8].

This is to ensure that web developers, when creating their sites, do so in a way that people who use assisted aids, such as visually impaired people who use screen readers, can navigate within the site to That can search and use the information deposited in the website. This is often a frustrating experience when it comes to visiting complex websites since the main tool of them, which is the screen reader, fails to quickly identify the available sections of the page due to the linear reading they employ, While the shortcuts that make it possible to skip to the main content of the page can also cause serious navigation problems [9].

In Ecuador in 2014 began to take the first steps of the country on its way to accessibility at the digital level. Now 2 years later, in 2016, through the creation of a technical accessibility standard for the state's web pages, the NTE INEN - ISO / IEC 40500. It is a faithful reference to the guidelines set by the WCAG [10] of the W3C . WCAG 2.0 is the latest version of the Web Content accessibility guidelines of the World Wide Web Consortium (W3C) [11].

Although there are recognized organizations of standardization such as the International Organization for Standardization (ISO) or the American National Standards Institute (ANSI), there are others such as the W3C that have so-called de facto standards, thanks to their use in practice [12] and thus have become the benchmarks at the international level in web accessibility.

For the development of web pages can be included numerous programming languages, but basically a website can be built entirely by HTML to create the structure of the page and by CSS for the design of it.

HTML (HyperText Markup Language), is a markup language used to define the structure of web pages; Is the basic language of the web, which is used for the creation of content or web pages [13].

CSS (Cascading Style Sheets), is the language used for the presentation of the web page, which includes aspects such as colors, letter font, as well as compatibility of web pages for different mobile devices [13].

For this research will be used the most recent versions of both languages, which are HTML5 and CSS3 since in both versions have built-in tags that help improve accessibility for users.

A set of special attributes called ARIA (Rich Internet Access Applications) will be used to make web applications more accessible, allowing to mark places where content will be changed or to specify simple roles [14]

METHODOLOGY

All research, in addition to having its problem and objectives correctly defined, must also have a methodology to follow since, in general, researchers in training when approaching their object of study, usually do from a personal experience to interpret the Results at their own discretion.

The nature of this research, because it is a case study, is qualitative, focuses on achieving an approach to reality from a more human perspective of the construction of a social fact [15], through the search for information from Reference present in studies on the subject from countries that already understand and encourage the completion of web accessibility, using as a technique a comprehensive reading about accessibility in the country together with the analysis of the best guides used as international standards, achieving As a result, to construct an idea that is as close to reality as possible about the true situation of web accessibility in Ecuador, in order to determine the factors responsible for not complying with this aspect.

Culminating with the process of developing an interactive web guide oriented to web developers, based on the highest international standards of web accessibility in order to correct the problem that revolves around the lack of awareness of the developers who do not take into account The aspect of accessibility in the importance that should, in order to later appreciate in the medium term, an increase of designed and adequate websites that comply with a basic level of web accessibility for visually impaired people.

RESULTS

This guide is based on the guidelines of WCAG 2.0 to achieve the level of conformity A, which ensures the basic level of accessibility. By complying with this level of compliance, it is established that the website will pass positively accessibility tests carried out by means of tools such as the TAW or the Examiner [16], or by means of indicators determined in independent work On accessibility by analyzing valid web documents, images, headers, links or forms [17]. Although the WAI (Web Accessibility Initiative) emphasizes the importance of manually performed tests on the automatic, since they can only verify compliance criteria that support automation [18], although tools such as TAW can analyze all The pages of a website by entering its URL unlike others that only are responsible for evaluating the main pages of each site [19].

The guide, although designed to improve the accessibility of people with visual impairment, has the necessary guidelines to cover other types of disability, since this is how you can develop a web site accessible at its basic level.

It is composed of 4 fundamental principles with 3 levels of conformity [20] in addition, each principle has guidelines and these in turn, criteria. This guide is intended to reach the level of basic access that is Level A, by complying with its guidelines and conformity criteria of WCAG 2.0 summarized in this interactive guide.

The introductory page of the guide, as well as informational content on WCAG 2.0, has videos on the main accessibility issues according to several studies, as well as an introduction to the new HTML5 ARIA tags, important for designing websites with dynamic content since Allows developers to create functions and behaviors for the dynamic content of the page thus allowing a better experience for users who use assisted technologies [21] to navigate websites.

Then there is the first principle, along with a description of it with its guidelines, which have their definitions and examples (see pictures 1 and 2) that comply with this guideline for the developer to acquire the theory and examples necessary to assimilate Successfully what you are reading; At the end of each principle there is a small evaluation for the developer of ten questions about everything learned from the guidelines throughout the beginning (see Figure 3), with different types of questions in order that the knowledge gained, Are reinforced.

Figure 1: Accessibility guide - Content

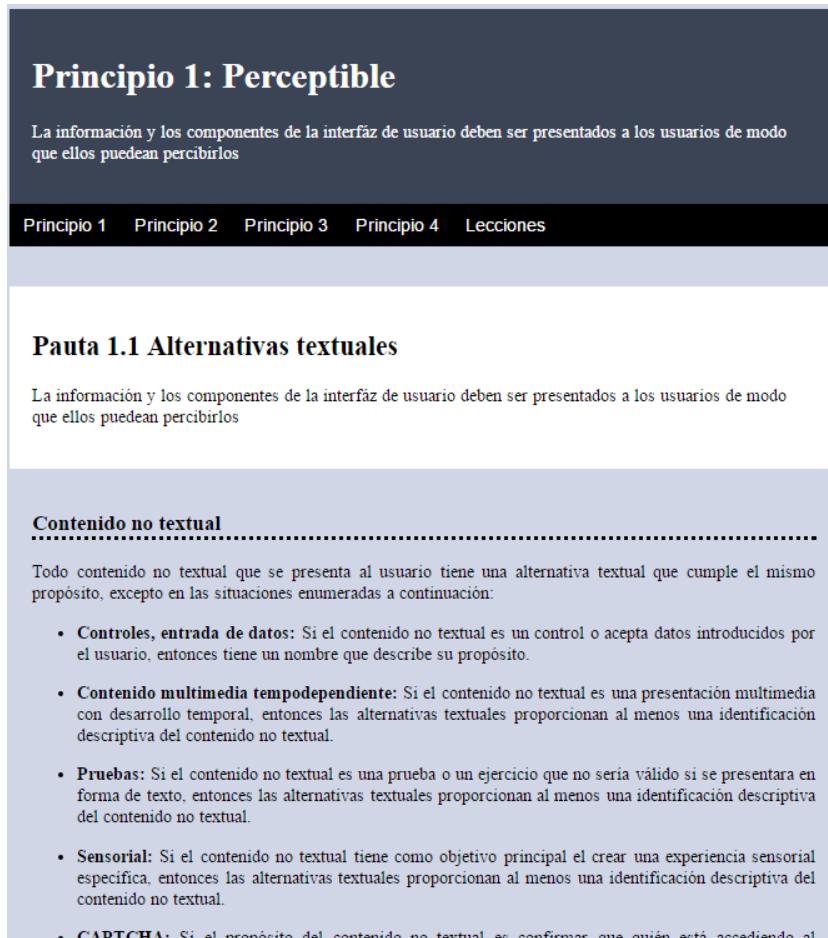


Figure 2: Accessibility guide - Examples



Figure 3: Accessibility guide - Lessons

Preguntas del Principio 1

1. ¿Cuál atributo define una descripción larga de una imagen. ?
 - ☐ a. alt
 - ☐ b. longdesc
 - ☐ c. description
 - ☐ d. name
2. ¿Para mejorar la accesibilidad para las personas con discapacidad visual, una imagen además de un título, debe poseer?
 - ☐ a. Datos del autor
 - ☐ b. Un texto alternativo
 - ☐ c. Una copia descargable
 - ☐ d. Enlace a la Wikipedia
3. ¿Una imagen que muestra a un dictador y posee el título de 'Las Crónicas de la Guerra', debe poseer como texto alternativo...?
 - ☐ a. El Dictador
 - ☐ b. Adolf Hitler
 - ☐ c. Las Crónicas de la Guerra
 - ☐ d. Imagen1
4. En una publicación de un post, se colocan varios iconos con diferentes motivos, uno de Atención, que marca el inicio de un párrafo importante, y otro con el de una impresora junto a la palabra Imprimir. La alternativa textual de este ícono sería:
 - ☐ a. Alt= "Impresora"
 - ☐ b. Alt= "Imprimir"
 - ☐ c. Alt= ""
 - ☐ d. Alt= "Impresión"
5. Un gráfico de barras compara los artículos vendidos en los meses de junio, julio y agosto. La etiqueta corta dice "Figura uno: Ventas de junio, julio y agosto". Una descripción más extensa debería tener...
 - ☐ a. El nombre de los autores, la compañía responsable y el año.

DISCUSSION

The guide is designed so that the developer can create accessible websites at least at a basic level, opening a new field of interest in the web development helping to raise awareness in their environment about what is web accessibility for the visually impaired. It is available in the link: <http://accesibilidad.atwebpages.com/>.

CONCLUSIONS

- In determining the considerations necessary to implement accessible websites by studying different guides and standards, it is concluded that WCAG is the most comprehensive guide to web accessibility, as it covers different types of website content, bad practices and recommendations with Techniques to avoid them.
- Achieving a high level of accessibility does not 100% ensure that a person, for example with multiple disabilities, can fully access the content of a website, while a basic level of accessibility not only helps people with Disability, but also to other users.
- Examples of HTML code successfully complement the understanding of the content to the web developer.
- The implementation of the interactive guide on a website increases the reach of its content to a large number of users while allowing a better understanding of the accessibility standards in force in the country for the learning of website developers.

- A. C. Adriana Martín, “Reingeniería Orientada a Aspectos para mejorar la Accesibilidad de sitios Web,” GIISCo Research Group , Buenos Aires, 2007.
- A. Herrouz, C. Khentout e M. Djoudi, “Navigation Assistance and Web Accessibility Helper,” *International Journal of Application or Innovation in Engineering & Management* , pp. 517 - 523, 2013.
- Afilias Technologies, “Ready mobi,” 2016. [Online]. Available: <http://ready.mobi/>.
- Beyond Security Inc, “Test the Security of Your Website or Blog - Free,” 2016. [Online]. Available: <https://www.scanmyserver.com/>.
- C. A. Sam-Anlas e Y. Stable-Rodríguez, “Evaluación de la accesibilidad web de los portales del Estado en Perú,” *Revista Española de Documentación Científica*, pp. 1 - 15, 2015.
- C. Bermúdez Tamayo *et al.*, “Cuestionario para evaluar sitios web sanitarios según criterios europeos,” *Atención primaria*, vol. 38, no. 5, pp. 268–274, 2006.
- C. F. Pérez and I. González Mateos, “Modelos para evaluar la situación de las bibliotecas escolares y la calidad de sus sitios web,” *Investig. Bibl.*, vol. 28, pp. 29–50, 2013.
- CEAACES, “Qué hacemos,” 2014. [Online]. Available: <http://www.ceaaces.gob.ec/sitio/que-hacemos/>.
- D. D. Jatmiko Suwawi, E. Darwiyanto, and M. Rochmani, “Evaluation of academic website using ISO/IEC 9126,” *3rd Int. Conf. Inf. Commun. Technol. ICoICT 2015*, pp. 222–227, 2015.
- D. R. Álvarez Mendoza, A. M. González Hurtado e A. A. Navarro, “Pautas y herramientas automáticas para evaluar la accesibilidad en los contenidos de las páginas web,” *Serie Científica de la Universidad de las Ciencias Informáticas*, pp. 1 - 10, 2012.
- D. Wood e S. Hollier, “The new accessibility panic ’: Remaining challenges to the achievement of Australia' s National Transition Strategy,” *Proceedings of the 11th Web for All Conference* , pp. 2 - 5, 2014.
- Diccionario de la Real Academia Española, “Accesible,” Madrid, 2014.
- E. Gutiérrez y Restrepo, “SIDAR Organization,” 2011. [Online]. Available: <http://www.sidar.org/ponencias/2011/utn/>. [Acesso em 20 Julio 2016].1]
- F. A. Ocaña e A. d. M. García, “Modelo de gestión de documentos docentes en un centro universitario , basado en hipervínculos,” *Revista de Universidad y Sociedad del Conocimiento*, pp. 130 - 147, 2012.
- F. M. Melo Alves and M. L. Quiroa Herrera, “Análisis y evaluación de sitios Web de bibliotecas nacionales: los casos de Brasil y de Portugal,” *Rev. española Doc. Científica*, vol. 30, no. 2, pp. 199–217, 2007.
- G. Benigni, J. A. Ordaz, O. Gervasi, and S. Pallottelli, “USABILIDAD ÁGIL Y REINGENIERÍA DE SITIOS WEB : USABAGLEWeb,” *Rev. Multidiscip. del Cons. Investig. la Univ. Oriente*, vol. 23, pp. 51–61, 2011.
- Gobierno Electrónico, “Gobierno Electrónico,” 2014. [Online]. Available: <http://www.gobiernoelectronico.gob.ec/gobierno-electronico/>.
- GT.net, “Analyze your site’s speed and make it faster.,” 2017. [Online]. Available: <https://gtmetrix.com/>.
- HubSpot, “HOW STRONG IS YOUR WEBSITE?,” 2017. [Online]. Available: <https://website.grader.com/>.
- I. Hernández-Arteaga, “Investigación cualitativa: una metodología en marcha sobre,” *Rastros rostros*, pp. 57 - 68, 2012.
- I. M. Caluguillin e E. A. Maya, “Entorno Dinámico de Aprendizaje para personas no videntes, para la Facultad de Ciencias Aplicadas.,” *Universidad Técnica del Norte*, Ibarra, 2015.
- INEC, “Ecuador en cifras: Información censal cantonal,” 2010. [Online]. Available: <http://www.ecuadorencifras.gob.ec/informacion-censal-cantonal/>.
- INEN, NTE INEN-ISO 40500, Quito, Pichincha, 2014.
- INEN, Reglamento Técnico Ecuatoriano RTE INEN 288 “ACCESIBILIDAD PARA EL CONTENIDO WEB”, Quito, Pichincha, 2016.
- ISO, “International Organization for Standardization,” 2006. [Online]. Available: <https://www.iso.org/obp/ui/#iso:std:iso-iec:25062:ed-1:v2:en>.
- ISO, “ISO/IEC 25010,” 2016. [Online]. Available: <http://iso25000.com/index.php/normas-iso-25000/iso-25010>. [Accessed: 29-Aug-2016].
- ISO, “Sobre ISO,” 2016. [Online]. Available: <http://www.iso.org/iso/home/about.htm>.
- J. A. Riaño Herrera e J. A. Ballesteros Ricaurte, “Aspectos y Normas de Accesibilidad Web,” *Ingenierías USBMed*, pp. 26 - 32, 2014.
- J. Díaz Campo, “Las cadenas de televisión españolas en Internet : un estudio sobre la calidad de sus sitios web,” *Estud. sobre el Mensaje Periodístico*, vol. 20, pp. 67–83, 2014.
- J. M. García Fernández, “Situación actual de los sitios web de las bibliotecas de la unam,” *Bibl. Univ.*, vol. 16, pp. 109–122, 2013.

- J. R. Hilera, L. Fernández, E. Suárez e E. T. Vilar, “Evaluación de la accesibilidad de páginas web de universidades españolas y extranjeras incluidas en rankings universitarios internacionales,” *Revista Española de Documentación Científica*, pp. 1 - 16, 2013.
- M. . I. Laitano, “Accesibilidad web en el espacio universitario público argentino,” *Revista Española de Documentación Científica*, pp. 1 - 9, 2015.
- M. D. Olvera and M. Aguilar Soto, “Los sitios web académicos con información de postgrado herramientas para su evaluación,” *Investig. Bibl.*, vol. 25, pp. 31–57, 2011.
- M. G. Miranda, A. E. Martín e G. Gaetan, “Mejora de la accesibilidad web mediante el uso de agentes inteligentes,” *Informes Científicos y Técnicos (Universidad Nacional de la Patagonia Austral)*, pp. 133 - 160, 2013.
- M. Karhu, J. R. Hilera, C. Cano e M. J. Rueda, “Accesibilidad y legibilidad de las webs universitarias en Finlandia: presente y futuro,” *REICIS - Revista Española de Innovación Calidad e Ingeniería del Software*, pp. 22 - 35, 2012.
- M. V. Sappa Figueroa, P. L. Alfonzo, S. I. Mariño e M. V. Godoy, “Evaluación de la Accesibilidad en Dos Sitios Bancarios Nacionales Dependientes de la Administración Pública,” *Revista Latinoamericana de Ingeniería del Software*, pp. 144 -148, 2014.
- Metricspot, “Herramientas de Análisis Web y Auditoría SEO,” 2017. [Online]. Available: <https://metricspot.com/es/>.
- Microsoft, “Browser screenshots,” 2016. [Online]. Available: <https://developer.microsoft.com/en-us/microsoft-edge/tools/screenshots/>.
- Ministerio Secretaría General de la Presidencia, *APRUEBA NORMA TECNICA PARA EL DESARROLLO DE SITIOS WEB DE LOS ORGANOS DE LA ADMINISTRACION DEL ESTADO*, 2006.
- Moz, “Moz,” 2017. [Online]. Available: <https://moz.com/products/pro/seo-toolbar>.
- N. Fernandes, T. Guerreiro, D. Marques e L. Carriço, “Optimus web: selective delivery of desktop or mobile web pages,” *Proceedings of the 12th Web for All Conference*, pp. 1 - 4, 2015.
- O. A. Vega e R. E. Vinasco-Salazar, “CAPTCHA: ¿solución para la seguridad informática o problema para la accesibilidad/usabilidad web?,” *e-Ciencias de la Información*, pp. 1 - 9, 2014.
- Ó. R. González López, T. M. Bañegil Palacios, and M. Buenadicha Mateos, “El índice cuantitativo de calidad web como instrumento objetivo de medición de la calidad de sitios web corporativos,” *Investig. Eur. Dir. y Econ. la Empres.*, vol. 19, pp. 16–30, 2013.
- P. Gadde e D. Bolchini, “From Screen Reading to Aural Glancing: Towards Instant Access to Key Page Sections,” *Proceedings of the 16th international ACM SIGACCESS conference on Computers & accessibility*, pp. 67 - 74, 2014.
- P. Toledo Morales, J. M. Sánchez García e J. J. Gutiérrez Castillo, “EVOLUCIÓN DE LA ACCESIBILIDAD WEB EN LAS UNIVERSIDADES ANDALUZAS,” *Pixel-Bit. Revista de Medios y Educación*, pp. 65 - 83, 2013.
- R. Espinosa Castañeda e H. I. Medellín Castillo, “Análisis y evaluación de la generación de iconos mentales en personas invidentes a partir de la percepción virtual táctil utilizando realidad virtual y sistemas hápticos,” *ICONO14: Revista de Comunicación y Tecnologías Emergentes*, pp. 296 - 317, 2014.
- R. Rodríguez Martínez, L. Codina, and R. Pedraza Jiménez, “Indicadores para la evaluación de la calidad en cibermedios: análisis de la interacción y de la adopción de la Web 2.0,” *Rev. Española Doc. Científica*, vol. 35, no. 1, pp. 61–93, 2012.
- R. Rodríguez-Martínez, L. Codina e R. Pedraza-Jiménez, “Indicadores para la evaluación de la calidad en cibermedios: análisis de la interacción y de la adopción de la Web 2.0,” *Revista Española de Documentación Científica*, pp. 61 - 93, 2012.
- S. d. J. Torres Rengifo, A. M. López e J. G. Vargas Cano, “Un portal en la UTP con competencias para mejorar la accesibilidad Web de las personas con discapacidad en Colombia,” *Scientia Et Technica*, pp. 98 - 103, 2012.
- S. Keith, N. Floratos e W. Gill, “Certification or conformance: making a successful commitment to WCAG 2.0,” *Proceedings of the International Cross-Disciplinary Conference on Web Accessibility*, pp. 1 - 4, 2012.
- SENPLADES, *Plan Nacional de Buen Vivir 2013 - 2017*, Quito, Pichincha, 2013.
- SIDAR Organisation, “Legis 508: SIDAR Organisation,” 07 Octubre 2007. [Online]. Available: <http://www.sidar.org/recur/direc/legis/508.php>.
- T. I. Solovieva e J. M. Bock, “Monitoring for Accessibility and University Websites: Meeting the Needs of People with Disabilities,” *Journal of Postsecondary Education and Disability*, pp. 113 - 127, 2014.
- Universidad de Alicante, “Accesibilidad: Universidad de Alicante,” 2013. [Online]. Available: accesibilidadweb.dlsi.ua.es.

Universidad de Illinois, "Functional Accessibility Evaluator 2.0." [Online]. Available: https://fae.disability.illinois.edu/anonymous/?Anonymous Report=/.

V. L. Hanson e J. T. Richards, "Progress onWebsite Accessibility?," ACM Transactions on the Web (TWEB), pp. 1 - 30, 2013.

V. Melnyk, V. Ashok e Y. Puzis, "Look Ma, No ARIA: Generic Accessible Interfaces for Web Widgets," Proceedings of the 12th Web for All Conference, pp. 4 - 7, 2015.

W. F. Betancourt, "Sitio Web acerca del sistema normativo del Ministerio de Educación para la preparación jurídica de los cuadros en la Universidad Pedagógica de Pinar del Río," Mendive, p. 8, 2013.

W3C, "Accesibility: W3 Organisation," 31 Julio 2005. [Online]. Available: <https://www.w3.org/WAI/intro/accessibility.php>.

W3C, "Sobre el W3C," 2016. [Online]. Available: <http://www.w3c.es/Consortio/>.

W3C, "W3C - Web Accesibility Initiative," Septiembre 2005. [Online]. Available: <http://www.w3c.es/Traducciones/es/WAI/intro/accessibility>.

W3C, "W3C Consortium," 2016. [Online]. Available: <https://www.w3.org/html/>.

W3C, "World Wide Web Consortium WCAG," Octubre 2012. [Online]. Available: <https://www.w3.org/WAI/intro/wcag>.

World Wide Web Consortium, "Markup Validation Service," 2015. [Online]. Available: <https://validator.w3.org/>.

World Wide Web Consortium, "Unicorn - Validador Unificado del W3C," 2015. [Online]. Available: <https://validator.w3.org/unicorn/>.

Delete False Dichotomies, Enter Conjugate Qualities

Ali BAYKAL

*Faculty of Educational Sciences,
Bahcesehir University,
Istanbul, Turkey
ali.baykal@es.bau.edu.tr*

ABSTRACT

Instructional design like many other human endeavors is an assembly of decisions. Ultimately decision making is making choices from among the options whether given or created. This article analyses paired dynamic quality attributes of systems as applied to instructional design. To simplify the topic by examples take unity-variety: Unity is responsible for organizational identity. It may end up with uniformity if the designer omits variety. Stability-flexibility is another concurrent bipolar quality. Stability is necessary for maintenance while flexibility is essential for adaptability. Third but not the last example is integration-differentiation: Sub-components are integrated among themselves to constitute the whole. However, every element must have a unique function to be differentiated within the whole. Conjugate qualities are not falsifying alternatives but complementary attributes essential for effectiveness and efficiency of the instructional design and practice. Conjugate qualities do not comprise opposing options but two domains of opportunities to be utilized in optimal proportions. Other examples of conjugate qualities will be extracted from theory and practice relevant to the ICTs in education.

Keywords: *Instructional design, quality attribute, false dichotomy, conjugate quality, bi-polar quality*

INTRODUCTION

In every domain of life one confronts with dilemma within which a choice has to be made. Instructional design is not an exception. There are so many attributes expected of instructional designs implicitly or explicitly. Most of these attributes depend on the creativity of the designer. Since creativity requires originality, fluency, and flexibility these attributes will eventually turn out to be case specific, intuitive, and untaught artifacts. For instance the designer may promote a certain philosophy, content, method, gadget, so and so forth. Also most of the time, these traits compete with each other. One may give emphasis on the humanitarian aspect of the instructional process rather than the technological innovation involved. While making their decisions designers must be aware of the options available. The purpose of this paper is to review the implications of notorious false dichotomies, and to discuss how to consolidate them as conjugate qualities in instructional design. The “applicability of assertions” will be tested by the real or hypothetical, but definitely plausible examples.

TRUE AND FALSE DICHOTOMIES

There many instances in any process in which one comes to cross-roads and has to make forced choices: Stop or go ahead, turn left or right, say yes or no, see if what has been done right or wrong. If the options are mutually exclusive the case is a true dichotomy. No one can eat the cake, and keep it too. There are so many false dichotomies in every domain of life but of course all dichotomies are not false (Joerges, 1997).

The main concern of this paper is to focus on false dichotomies. Verbal, logical and/or scientific arguments must converge upon the examples. First of all a distinction must be made between the two proximal concepts: Contrary and contradictory. Consider the pair of adjectives useful-useless and useful-harmful. The former pair is an example for contrary attributes and the latter one is for the contradictory. One must avoid confusing the two. If we consider only the opposite polarities we may tend to judge impulsively in a hurry ignoring the intermediate values. We must also distinguish between the positions of the decision makers. If the decision maker is a consumer then s/he has to make a real binary choice to buy or not to buy the knife. There is no mid-point between Yes, or No. The option “Perhaps” is embedded within the “No”. This is a true dichotomy, a binary choice. Designers however have to consider almost all of the intermediate values between two opposite polarities whether contrary or contradictory. Every quality is a matter of degree for the designer. We cannot just say that the computers are absolutely useful or useless in education. We cannot expect the same functions either from the teacher or from the technology. There are always intermediate points between the bipolar qualities or binary options. In cases of conflicts relying on only two sides always jeopardizes the effectiveness or at least the efficiency of the design. Because approval of false dichotomies will distort the reasoning, set limits to imagination, restrict the vision, and encourage superstitious beliefs.

Dichotomies discourage imagination and an awareness of complexity and encourage reductionism and simplistic thinking. (Govier, 2007)

Designers do not have to think in binary terms. They are capable of recognizing the concepts like continuum, range, degree, variety, and enrichment. Systems theory deserves a special notification because it enables the designers to understand, describe, and prescribe the organized complexities. This is not to reject the true dichotomies which are formed by the contrary assertions. Designers are bound to dichotomous apparatus like ‘right/wrong’, ‘correct/incorrect’, ‘true/false’ and ‘yes/no’ at least to express their final decision.

But on the other hand there are so many false dichotomies which emerge in many instances and in a variety of contexts. Practicality and parsimony cannot be an excuse to reduce a compound attribute to simplify into a bipolar choice, because design is not a simple task. High level cognitive, affective and psycho-motor skills require extremely intricate learning system designs. It would be self-refuting to undermine the role of designer’s mind to design an instructional system to construct wisdom in the student’s mind. Luckily homo-sapiens is capable of coping with complexity (Runco, 2014).

FALSE DICHOTOMIES RELEVANT TO INSTRUCTIONAL SYSTEMS

The major assumption of the approach is that all educational practices are unavoidably open systems by their very nature. Open systems metaphor is not an alternative methodology by which one can design better, more effective or more efficient educational practices. It is a paradigm which enables the designer to describe, explain, predict and prescribe every kind of educational project which may be good or bad for some reason. It is a value-free model by which one can analyze a liberal or totalitarian school of education. No one has to comply with any of those myriad of learning theories to develop a science course, neither to deny them. The least effective and the most efficient educational practices can be explored with the help of systems concepts. All instructional systems, whether we like them or not, work towards accessing or recoil from them, have structural elements, and functional processes. The word “system” in the term “educational system” is not used arbitrarily. On the contrary, it is a technical concept that is both descriptive and explanatory. False dichotomies will be exemplified in terms of the vocabulary used in open systems thinking (Katz&Kahn, 1966).

There are mainly two sets of optional items in the design procedure: First set of items encompasses the structural components (e.g. objectives, physical settings, social settings, instructional methods, and educational media) of the learning system. Some false dichotomies relevant to instructional components are listed in Table 1.

Table 1. False dichotomies relevant to instructional components

System Components	False Dichotomies
Input	Nature-Nurture
Output	Competitive-Ubiquitous
	Practical-Theoretical
	Values-Skills
Competency Aspects of Objectives:	Intellectual-Practical
	Vocational-General
	Convergent-Divergent
Subject Matter	Content based-Competency based
	Disciplinary-Interdisciplinary
	Spiral-Core (Curricular paradigm)
Physical Settings	Large-Small
	Special Purpose-Multi Purpose
Social Settings	Mixed-Fixed
	Homogeneous-Heterogeneous
	Democratic-Autocratic
Methods/Strategies/Approaches	Expository-Inquiry
	Teacher Centered-Student centered
	Inductive-Deductive
Educational Media	Distant-Face to face
	Hardware-Software
	Techno-mania-Technophobia
Teacher Paradigms	Born-Made
	Authority-Coach
	Specialist-Generalist
Assessment &Evaluation	Norm referenced-Criterion
	No grades-Tough grades
	Centralized-Decentralized

DYNAMIC SYSTEM CHARACTERISTICS AS CONJUGATE QUALITIES

A system consists of actions, not only of objects. The dynamics that are to ensure learning in educational systems ought to be seen from the viewpoint of mutual relations and dependencies. The optimal level of these characteristics reflects the value, and soundness of the school system. A list of major dynamic system attributes will be reminded below. These are bipolar qualities which should not alternate but complement each other. False dichotomy is the case when the designer overemphasizes one of these qualities over the other. To the extent that the designer achieves their optimal proportions these bipolar qualities conjugate each other i.e. join together.

1. Integration-Differentiation: The fact that each component of a system has its own unique function is an indicator of differentiation. Integration is what holds each of the separate elements together thus providing coherence. Five sense organs have their own unique capabilities but perfectly coordinated in a human body. Same is true for sub-systems like circulatory, respiratory and digestion sub-systems in living organisms. Resistances, capacitors, inductances etc. are neither redundant nor independent elements in an electrical circuitry designed for a prescribed output. Departments in a faculty have their own unique objectives and functions but they share some values and principles to contribute to some multifold goals. Differentiation is essential for effectiveness, integration supports efficiency. Tendency to exaggerate differentiation results with breakdown of the system. Drift to complete integration ends up with monolithic, solid, static structures. Table 2 is an attempt to display how to make “integration-differentiation” coupling a conjugate quality, and how to avoid making it a false dichotomy.

Table 2. Examples for the uses and misuses of “integration-differentiation” in an instructional system

Instructional sub-components	Differentiation: Unique characteristics/Functions
Home	Preparatory and/or remedial readings
Classroom	Group discussions, presentations
Laboratory	Individually prescribed experiments
Textbook	Storage and retrieval of visual information
Smart-Board	Expository displays by a presenter (teacher)
Smartphone	Quick and instant access to information in any setting at any time
Student	Individual learner, target for educational objectives, reference for evaluation
Class	Relatively stable unit of social network among students
Family (Parents)	Investor, observer, stake holder, partner
Staff	Administrators, counsellors,
Teacher	The one authorized to control all of the above
Lecture	Easy, quick and organized presentation of advance organizers
Drill &Practice	Active appropriate student involvement on the learning tasks
Instructional sub-components	Integration: Complementary characteristics/Reinforcements
Home-School	Continuity of settings, home-work, extra time-on-task
Classroom-Laboratory	Unification of theory and practice
Textbook-Computer	Permanence and transience, speed and accuracy, content and process
Lab-Computer	Real and virtual, observation and recording, authenticity and simulations
Teacher-Parents	Feedback, guidance, cooperation, collaboration, coordination
Instructional sub-components	False dichotomy: Omission of differentiation (overemphasized integration)
Teacher-Slide projector	Teacher reads the text on the screen
Using computer as a video	A demonstrative movie on the computer without any interactivity
Lecture-Textbook	Teacher gives a chalk-talk on the subject matter verbatim from the textbook
Homework-Exam	Identical or similar tasks both in the exam and in the homework
Instructional sub-components	False dichotomy: Omission of integration (exaggerated differentiation)
Teacher-Slide projector	Teacher tells an entirely different story irrelevant to the graphics on the screen
Using computer as a video	Two different movies without any thematic relevancy
Lecture-Textbook	Teacher gives a ceremonial talk independent of reading assignment given before
Homework-Exam	Including difficult exam questions that doesn't compare the drill assignment

Within an educational system, there are different settings, ranging from home to school, and factories to oceans. There is a variety of equipment from computer to blackboard. (Mergel, 1998; Oakman, 1995)

Educational systems accommodate array of people from students and teachers to administrators and parents. There are various processes like exams, lessons, and recreational activities. In order for all these diverse elements to reach their varied objectives, they have to get integrated with one another. Instances of integration include homework (integrating home with school), counseling (integrating individuals with society), and the content of lessons with instructional equipment. Teachers being forced to become guidance counselors, encouraging guidance counselors to evaluate teachers, wasting the computers as electronic page turners, the turning of television into an illustrated radio or a cartoon book, the use of laboratories as classrooms, and delivering lessons in lecture format are all examples that are contrary to the principle of differentiation. On the other hand, irreconcilable discord between teachers and guidance counselors, discriminatory-preferential treatment by administrators, video films having nothing to do with the subject matter contained in textbooks, and computer software that cannot be used with available computer hardware are all examples of failure in integration. The extreme points of integration and differentiation are redundancy and chaos respectively.

2. Flexibility-Stability: Every system tends towards both maintenance and expansion. To be able to adapt to environmental changes, a system must not only be flexible to some extent, but also robust enough to withstand negative impacts. Nevertheless, if it is too flexible, the system slackens and disintegrates. Similarly, excessive resilience impedes growth and development. Car tires are manufactured to be flexible enough to adjust to the ground but also solid enough to resist the external forces. Skyscrapers are built on stable foundations but bendable columns against wind and earthquake loadings. So are the long steel bridges. Muscles are relatively flexible elements responsible for movement. Bones are relatively solid to maintain equilibrium. Homeostasis combines stability and flexibility in organisms in a single word. The literature on educational design and practice suggest that sound principles ought to be used instead of rigid rules by the administrators and evaluators. Even in testing procedures strict rules are gradually being replaced by more adaptive means and methods. Table 3 is a list of intuitive examples to delineate flexibility and stability in bi-polarity.

Table 3. Stable or flexible modes of some selected instructional sub-components

Instructional sub-components	Stable	Flexible
Educational objectives	Set by ministry	Arranged by the teacher
Seating arrangement in a class	Fixed	Mixed
Physical setting for interaction	Rectangular classroom	Fat L classroom
Mode of interaction	U-Shaped seating	Roaming around
Peer partnership in a lab	Permanent	Rotational
Syllabus	Strict	Tentative
Teaching methods	Lecture	Discussion
Information storage	Textbook	Computer
Information retrieval	Sequential	Random access
Reinforcement schedule	Fixed	Intermittent
Homework assignments	Common for all	Voluntary projects
Evaluation	Standardized	Contract based
Student Involvement	Teacher Directed	Student initiated

3. Equifinality-Multifinality: The state where a system has the necessary means and processes to attain any goal or objective is called equifinality, while having the means and processes to achieve more than one goal or objective is called multifinality. In other words if the design allows more than paths to achieve the same objective that's what is meant by equifinality. Equifinality is a measure of the system's effectiveness. Multifinality, on the other hand, is a measure of its productivity, because the same path yields two or more outcomes. Table 4 displays two hypothetical paths of instructional system configurations. Path A illustrates multifinality. First objective (Obj 1) can be attained at by two different configurations (Path A and Path B). The equifinality approximates to single-finality when overstated. Multifinality ends up with random occurrence when inflated. Boosting one option at the expense of the other is another description of false dichotomy.

Table 4. Description of equifinality-multifinality in an instructional as a quality conjugate

Instructional system configuration	Inputs	Physical Settings	Social Settings	Educational Media	Teaching Methods	Teacher Functions	Objectives
Path A	Differential Readiness	Home	Individual study	Textbook	Lecture	Scaffolder	Obj 1
		Lab	Collaborative experience	Apparatus	Simulation	Reflective practitioner	Obj 2
Path B	Equal Readiness	Home	Individual study	Textbook	Lecture	Transmitter	Obj 1
		Lab	Parent support	Apparatus	SQRR	Catalyzer	

4. Permanence-Transience: Every instructional unit takes time: An instant or a life-time! Measurement of time in instructional design is as essential as it is in engineering. Some components (events or things) have to be relatively permanent for the maintenance of the system. Food is relatively permanent input than the air inhaled by the living organisms. So is the gasoline for a car compared to paint. Open doors are more transient elements than the floors in the buildings. Motion sensitive sliding doors can be good example how to optimize permanence and transience. Biorhythms are optimal cycles of events in living organisms. Objects and events in an instructional design have to be optimized within the permanence-transience interval. Physical settings are relatively more permanent than the social settings. Walls and furniture stay there overnight but groups come together and disperse relatively within shorter periods of time. Lessons are relatively more permanent than the breaks in the school. If the school bell rings permanently the classes degenerate. It has to be transient enough just to inform the beginning and the end of classes and the breaks.

The length of the period of storage and retrieval of data varies for different types of data. Student attendance must be recorded everyday. The period for quizzes may be left arbitrary to the teachers. Registration records may be updated annually or semester wise. Course grades will be kept forever. Mail addresses can be changed on demand. School performance on central entrance examinations will be appended each year. Some data can be used at the beginning of the year to see the students' level of academic performance. Assessment scores of classes can also be analyzed at the end of the term to see how each class compares to other class in the school.

The extreme permanency will result dullness and boredom. A long ceremonial talk by the dean on the commencement day is a very straightforward example. A sharp transience is practically the same with the immediate removal or the absence of the component. What is written on white-board or the visual slide on the screen cannot be shown forever but they shouldn't be removed immediately. To a great extent educational media is responsible for the permanence and transience of information storage and retrieval. Textbooks store huge amount of visual information in print almost permanently. Permanence in digital media is shorter compared to paper media for two reasons: First the magnetic materials (disks, flash-cards etc.) are more vulnerable to some conditions like heat, humidity, mechanical influences etc. Secondly the digital technology requires an intermediate technology for retrieval of information card readers, disk drivers etc. These intermediate technologies are developing so fast that they are becoming obsolete within short periods of time. Tablet PCs for instance cannot replay DVDs. Most of the floppy disks are just nostalgic collections objects. These are the subordinate reasons why designers have to consider permanence-transience as conjugate qualities.

SOME OTHER CONJUGATE QUALITIES AND THEIR BI-POLAR EXTREMITIES

Instructional designers can discover or invent other quality attributes with their conjugates. Table 5 exhibits some other desirable attributes expected of instructional systems with their extremities. These bi-polar extremes are the warnings to system designers against falsifying dichotomies.

Table 5. Some Extreme System Characteristics and their Optimal Boundaries as Conjugate Qualities

Extremities	Conjugate quality attributes within optimal boundaries	Extremities
Stiffness	Integration : Differentiation	Isolation
Rigidity	Stability : Flexibility	Volatility
Singularity	Equifinality : Multifinality	Turmoil
Adhesiveness	Permanence : Transience	Absence
Unresponsiveness	Persistence : Adaptation	Surrender
Inefficiency	Effectiveness : Efficiency	Ineffectiveness
Tight-fistedness	Parsimony : Prosperity	Waste
Dullness	Predictability : Originality	Illusory
Uniformity	Unity : Variety	Complexity
Doctrinaire	Demonstrative : Interactive	Demagogical
Archaic	Classical : Modern	Marginal
Gloomy	Realistic : Imaginative	Fictitious

The problem is many transferred authorities give advice to instructional designers showing one or the other polarity of conjugate qualities without considering its conjugate and ignoring the intermediate values. No one dares to suggest “Rigidity”, “Turmoil”, or “Inefficiency”. The point is if the designers exaggerate “Flexibility” then they may come up with “Volatile” means and methods. The question is whether “the abolishment of exams” is an imaginative proposal or not. Does the curriculum enrichment mean buying expensive toys for kindergarten children? Can the resistance to every change in the environment be called “persistence” in educational practice? If the teacher does not have another effective substitute for power-point presentation then “equifinality” ceases to exist in case of power failure.

QUANTITY QUALIFIES QUALITY

Conceptualizing the dichotomy (using separate and distinct categories of qualities) is not consistent with a coherent philosophy of science. What are given as qualities, are just prescriptive constructs. They are just the beginning and the end points. Quantitative methodologies ought to follow to enable the designers as operational as possible. It should be noted here that false dichotomization between qualitative and quantitative research has to be avoided.

The debate between qualitative and quantitative researchers is based upon the differences in assumptions about what reality is and whether or not it is measurable. The debate further rests on differences of opinion about how we can best understand what we "know," whether through objective or subjective methods (Newman & Benz, 1998).

According to Newman and Benz (1998) the differences between qualitative and quantitative research can be analyzed with respect to four criteria:

1. Is the objective reality sought through facts or is it socially constructed?
2. Is the purpose to look for causes or for understanding?
3. Is the research experimental / correlational or a form of ethnography?
4. Is the researcher's role is detached or immersed in the setting?

QUALITY ATTRIBUTES FOR QUANTIFICATION OF QUALITY

1. Access-Security: Data must be easily accessible to data consumers. An up-to-date medium is the Internet. There will be precautions to maintain the data security. There will be different access levels for administrators, teachers, parents and students. When a participant logs in data-storage system must produce a record for each entry (Mandinach, 2006).

2. Comprehensibility-Complexity: Data Comprehensibility deals with the understandability of the information. how understandable the functioning of the tool is; how clear the presentation of the data are; and how easy it is to make reasonable inferences from the information presented. The more understandable, the more likely the tool will be used. Some parts may be open to misinterpretation and ambiguity even by trained specialists. The multiple forms of graphic representations are intended to make the data readily understandable to different users. Too much emphasis on understandability ends up with oversimplicity.

3. Data for validity vs. validity of data: In any assessment program a precise definition of what is to be measured and what method of measuring it is the most appropriate are the most crucial issues (Bond, 2004; Guilford, 1965; Hambletone, 1978). Irrelevant assumptions, inconsistent definitions, incorrect evidence can easily be taken for granted all along the assessment program. Item format chosen, values accepted, omitted options, and logical comparisons to prior practice must be reviewed by the expert eye (Rust&Golombok, 2009). Data quality includes but is not limited to validity. For instance classical test theory is internally inconsistent in the quantitative reduction of test data. As the inter-subject variability decreases, the reliability coefficient may take minus values which contradict the conceptual and logical definitions of reliability. Also, reliability is indefinite when the variance diminishes. The desirable magnitude of the item difficulty index suggested by classical theory to optimize the reliability, contradicts the conceptual framework of validity. The performance of a student is defined as the composite of the truth and the error. The shortcomings of the theory stem from the assumption that the error varies randomly within the observed scores. Randomness could be taken as a measure of the error, instead of assuming that the error is random (Shannon and Weaver; 1949; McGill, 1954). Chance success can be eliminated without any extra irrelevant procedure for corrections. New quantifiers can be developed to describe the quality characteristics of a test items, and also inter-item and item-test relationships. No confirmatory factor analysis can correct the semantic inadequacies or distractors embedded in a statement of test item. Can there be linear structural model to correlate the intensity of stimuli with the amount of retention of response reinforced intermittently? The intensity of applause in a ceremonial talk as measured in decibels can hardly be used to interpret the meaning of a joke in its cultural context. Data for the construct validation of a test is mostly a qualitative adventure by its very nature. But the agreement among expert opinion can easily be expressed with a simple proportion.

4. Timeliness-Spontaneity: Data must be current and timely to be used for decision making. The delay between data collection and the decision making restrains the benefits of evaluations. Especially the time interval between the input and the feedback data is very crucial for educational assessments. On the other hand there are so many not premeditated learning experiences in an educational setting. Therefore the assessment system must be capable of managing spontaneous data which may arise from unplanned instructional endeavors. In classical testing programs steps are sequential and simultaneous for everyone. All of the students start responding to questions at the same time and drop their pencils when the bell rings. Such a timely, preplanned testing is not necessarily the best practice for today. On-line, web-based testing offers subjects self planned assessment schedule.

5. Measurement Equivalence vs. Discriminating Measures: It is difficult to compare observed mean scores in raw data without having measurement equivalence. A test or a subtest is said to have measurement equivalence across populations if subjects with identical scores on the construct have the same raw score at the item level, or at the subtest level. Since subjects differ with respect to the construct measured by items discriminating functioning of the item is widespread in test data. In free-format items, each item could evoke a myriad of different responses. In analyzing such data, it may be more practical to categorize these responses into a limited number of categories that can be rank ordered in order of attainment or intensity (Raju, Laffitte, Byrne, 2002).

6. Quantitative vs qualitative: In the past the quantitative research has been recognized as indispensable support for educational experiments and explorations. Recently however, a greater portion of educational research is qualitative in nature (Callingham and Bond, 2006).

Why do qualitative approaches appear to dominate this field?

Is it because that the usual quantitative methods are unable to discover the important qualitative aspects educational events?

Are there some qualities for which the principles of the metric system can be ignored?

Can any quantitative research methodology in education not sustain sensitivity to those significant qualitative aspects of educational research?

How can the general, applicable, communicable findings of quantitative research be left aside?

Some researchers maintain the view that any aspect of the human condition should not be described along a single dimensional scale (Medley, 2000). But the weight of a newborn baby or the height of a basketball player yield some information which cannot be overlooked. They may be insufficient all by themselves for the complete description of physical qualities. Is there a perfect qualitative description of the physical well being? Multiattribute measurement is essential but measurement of each attribute may be useful for some decision. In some cases a single index can be developed to summarize a set of attributes as single quantifier. Human Development Index or ICTs Index are commonplace examples among the many others. Obesity index for instance combines weight and height together and uses that score as a summary of physical and physiological well being.

There may be some practical concerns in such classifications. But the purposes for research projects are the same in essence. All scientific studies tend to produce a better descriptions, explanations and predictions about the phenomena within their scope. In qualitative research data are collected in free format styles such as interviews, essays, and observations. There may be no prior methodological reservation for the next coming stages. The researcher discovers patterns and assigns codes to these patterns during the data collection (Callingham and Bond, 2006).

These codes are nothing but nominal scale values some of which may comprise a new variable as data accumulates in progress. Formally this is not an endless process. There will be a point in time at which no new patterns appear. Then the researcher stops and reduces data into information. No matter how verbal or pictorial the codes are there will be implicit quantifiers in descriptions, comparisons etc.

UNIFYING THE QUALITATIVE QUANTITATIVE ATTRIBUTES

Data qualities summarized above ought to be seen from viewpoint of mutual relations and dependencies. The optimal level of these bipolar characteristics reflects the value and soundness of the assessment system. One can find some other unified bipolar features of a data system. A myriad of assessment procedures must be analyzed to discover the bipolarities relevant to a particular research which researchers run into. Bipolarities are discussed with reference to conventional assessment experiences. Some commonplace examples are given for clarification. The focus was on the research concept. The more bipolarities considered, the more complex and unclear the discussion will be. But this is the way to develop our conceptual skills. We must reflect upon at least two sides to every attribute one may come across. Such a reflection requires both theoretical and logical analysis. Theoretical analysis delineates natural world of beings while the logical reasoning deliberates the means and the ends of practical conduct. This is another bipolarity which requires reunion between two forms of reason. One should stay away from self-centered preferences to discriminate between theoretical and logical analysis. Because the overexpansion of either into the realm of the other. This is something which is consistent with the interconnectedness of structural elements. No single attribute can be subordinated to another. We cannot emphasize any quality at the expense of another. Bipolarity suggests that any attribute is composed of two challenging qualities in agreement. A compliant relationship between the two poles as such exhibit a variety within a unity. But bipolarity in open systems is not as simple as unity of opposites. The contradiction does not take place between the competing qualities, but between their extremities. In fact the extremities of desirable attributes of open systems do not qualify but rather turn down the system. In other words whenever a system assumes an extreme polarity of some attribute ceases to exist as a coherent system. Such a logical process has been referred as dialectics. Dialectics dates back to Plato. Hegel elaborated the dialectical thought. In lay conversation dialectics is immediately coupled with Marx and Marxist materialism. In the discussion here there are some differences between the optimization for compliance between the bipolar system attributes, and conventional Hegelian or Marxist dialectical approach. First of all bipolar attributes do not alternate but complement each other. Bipolar attributes are not antagonistic contradictions such as war or peace, life or death, yes or no etc. are at least virtually separable. For instance there are assessments based on measurement excellence, and yet there are some others which purify discrimination. The proposed approach here does not disqualify any quality, but rather attempts to unify them. In other words the bipolar attributes of systems can be identified and defined as independent parameters, but their coordinated standings is more explanatory and prescriptive as well. The fission of Only the extremities of bipolar attributes are antagonistic. The educational researcher's role is to discover the optimal values of bipolar characteristics for a given level of effectiveness and efficiency. Educational research designer is supposed to mediate the bipolar options to bring about a desirable composition. Second difference between the classical dialectical synthesis and the search for compliance is that in the former thesis and antithesis are not separable, but in latter the attributes bipolar attributes is possible but their fusion is more desirable.

CONCLUSIONS

All instructional components and sub-components are designed expecting a combination of bipolar quality constructs. The notion of the quality continuum, as opposed to a dichotomy, must be explored and emphasized on scientific grounds.

The dichotomies in educational program conceptualizations in higher education do not help us. I am speaking of the dichotomies between thinking and feeling, between theory and application, between content and process, and between learning from books and lectures on the one hand and learning from experience on the other. These dichotomies tend to obscure what takes place in learning that is deeply meaningful to the student as a person. (...) most of us know professors who never seemed to be aware of the false dichotomies in education (Koile, 1966, p. 60.)

False dichotomies mentioned above challenge to the intellectual value of instructional design. The truth is in many circumstances vibrate within the binaries. Instructional designers must recognize that they have polytomous options. Persistent opposition between “either/or” is a source of personal anxiety and a professional barrier for them. Their fluency will be escalated by “and/also” paradigm.

Due to the variety and abundance of quality attributes, designers might be confused, and be scared making mistakes (Haddad & Draxler, 2002; Sloep, Hummel, Manderweld, 2005). What they should do is to choose quality attributes and optimize polarities. The more qualities they choose and the more optimizations they make, the more they will exploit quality potentials of instructional design. Both of the quality couplings cannot be maximized simultaneously. There will be gap between designers and practitioners. Practitioners and even the students as consumers need training so that they can contribute critical and creative feedback about the design and its implementation. Teamwork is crucial. Academicians in the educational sciences are already sharing their views with one another. In every country the indispensability of educational investment has been accepted. Universities and non-governmental organizations may develop some prototype unit designs and hunt for funds to complete the series.

Collaborations with each other, across disciplines, and with practitioners and participants are ways to work together. This approach can enhance the quality of our work lives as well as our own leisure lives (Henderson, 2000).

At the end quality level of an assessment can be assessed by the level of reasoning it provides. These levels are parallel to Stevens scales of measurement.

Mathematical Level: Complete absence of dimension or construct being measured can be defined. Equidistant or uniform units of measurement exists. Thus proportional or differential comparisons are meaningful. Systematic and constant errors are eliminated, and random error can be tolerated by repetitive measurements. Numerical data is isomorph with the numbers. Mathematical formulas can be developed. All parametric statistics can be performed.

Analytical Level: Absolute absence of construct concerned is uncertain. Thus proportional reasoning is missing. There exists an arbitrary zero point which pertains all observations therefore constant error is not systematic and also does not mix with random error. Appropriate use of uniform units is possible. Comparisons can be made in terms of arithmetic differences. Parametric statistics can be performed if their distribution assumptions hold.

Exploratory Level: Observations are expressed in terms of ranks or ratings. Comparisons depend on ordinal positions of the subjects based on objective criteria. Non-parametric statistical inferences can be drawn. Assertions involve implicit quantifiers.

Classificatory Level: Objective discrimination with respect to a predetermined criterion; subjective selective engagement with context, often in supportive formats, appropriate recognition of conclusions but without verification, frequency distributions, intuitive taxonomies, colloquial or informal engagement with context.

Ipsative Level: Idiosyncratic engagement with context, tautological use of terminology, and demonstrating basic mathematical skills rhetorically, rough probabilistic estimations.

This hierarchical categorization is just an example of classificatory level reasoning. It is just another way of saying that the quality of reasoning ascends parallel to the increase in the amount of quantity involved. One may quite rightly challenge its designation and exemplary content, because it is a hermeneutic approach to quality versus quantity dilemma (Morgan, 2014).

REFERENCES

- Bond, T. G. (2004). *Validity and assessment: a Rasch measurement perspective*. Metodologia de las Ciencias del Comportamiento, 5(2), 179–194.
- Callingham, R. and Bond, T. (2006). Research in Mathematics Education and Rasch Measurement. *Mathematics Education Research Journal*. 2006, Vol. 18, No. 2, 1-10
- Govier, T. (2007). *Two is a Small Number: False Dichotomies Revisited*. (June 6, 2007). OSSA Conference Archive. Paper 57.
<http://scholar.uwindsor.ca/ossaarchive/OSSA7/papersandcommentaries/57>
- Guilford, J.P. (1965). *Fundamental Statistics in Psychology and Education*. New York: McGraw-Hill, Kogakusha, 1965.
- Haddad, W. D., & Draxler, A. (Eds.). (2002). *Technologies for Education: Potential, Parameters and Prospects*. UNESCO.
- Hambleton, R.K. et. al. (1978). Criterion-Referenced Testing and Measurement. *Review of Educational Research*. 48:1, (Winter 1978), 1-47.
- Henderson, K.A. (2000). False dichotomies, intellectual diversity, and the "either/or" world: Leisure research in transition. *Journal of Leisure Research*; Urbana32.1 (First Quarter 2000): 49-53.
- Joerges, C. (1997). *European Challenges to Private Law: On False Dichotomies, True Conflicts and the Need*

- For a Constitutional Perspective.* Warwick SPTL Conference 1997.
http://heinonline.org/HOL/Page?handle=hein.journals/legstd18&div=17&g_sent=1&collection=journals
- Katz, D., Kahn, R.L.(1966). *Common Characteristics of Open Systems*. (In Emery, F.E. (Ed.). (1970). *Systems Thinking*. Middlesex: Penguin Books)
- Koile, E.A. (1966). *The University Can Be a Personal Place*. Minnesota University. Minneapolis. 6624p.
Paper presented at a series of Seminars on the Social Psychology of the Future State Metropolitan Campus, the University of Minnesota, Minneapolis, April 18, 1966.
<http://files.eric.ed.gov/fulltext/ED038092.pdf>
- Mandinach, E.B., et. al. (2006). The Impact of Data-Driven Decision Making tools on Educational Practice: A Systems Analysis of Six School Districts. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, April 9, 2006.
- Mergel, B. (1998). *Learning Theories of Instructional Design*.
www.usask.ca/education/coursework/802papers/mergel/brenda.htm
- McGill, W.J. (1954). Multivariate Information Transmission. *Psychometrika*. 19:2, (June 1954), 97-116.
- Medley, M.D. (2000). *Using Qualitative Research Software for CS Education Research*. Department of Mathematics and Computer Science Augusta State University.
- Morgan, D.L. (2014). *Integrating Qualitative and Quantitative Methods. A Pragmatic Approach*. Los Angeles(Singapore: Sage Publications.
- Newman, I. &Benz, C.R. (1998). *Qualitative-Quantitative Research Methodology: Exploring the Interactive Continuum*. Southern Illinois University Press Carbondale and Edwardsville, p. 9.
- Oakman, R. L. (1995). *The Computer Triangle: Hardware, Software, People*. New York: John Wiley and Sons.
- Raju, N.S., Laffitte, L.J., Byrne, B.M. (2002). Measurement Equivalence: A Comparison of Methods Based on Confirmatory Factor Analysis and IRT. *Journal of Applied Psychology*. Vol. 87, No. 3, 517–529.
- Rust, J. &Golombok, S. (2009). *Modern Psychometrics*, (Third edition). London: Routledge, Taylor and Francis.
- Runco, M.A. (2014). “Big C, Little c” Creativity as a False Dichotomy: Reality is not Categorical. *Creativity Research Journal*. Volume 26, 2014 - Issue 1 Pages 131-132.
- Shannon, C.E., Weaver, W. (1940). *The Mathematical Theory of Communication*. Urbana: The University of Illinois Press, 1949.
- Sloep, P.; Hummel, H. Manderweld, J. (2005). *Basic Design Procedures for E-learning*. In R. Coper, C. Tattersall, (Eds.), *Learning Design*, Heidelberg: Springer.

Designing and Developing a Web Application Aor Learning Geography

Antonina PLUTINO

*Department of Humanities, Philosophy and Education
University of Salerno (Italy)
aplutino@unisa.it*

Stefano DI TORE

*Department of Humanities, Philosophy and Education
University of Salerno (Italy)*

Flora IPPOLITO

*Department of Humanities, Philosophy and Education
University of Salerno (Italy)*

ABSTRACT

This work proposes a didactic approach that is applied to new technological dimensions which, thanks to their multimedia and interactive aspects, impinge on the mechanisms through which cognitive processes organize coding and decoding of information. In other words, virtual environments act as dynamic spaces of action in which cognitive functions, students' communicative and social actions are catalysed. As a result, this modifies the conceptual maps through a 'click'. Hence, learning is seen as a product of the acquired understanding through a conscious interaction developed during sharing and cooperation activities. Through a neogeographic approach, the objective of this study is the creation of a didactic Web App called Geomoon that, besides its educational potential, can promote learning. A particular characteristic of the project is that it can be functional to a playful learning methodology through activities that allow meaningful learning using virtual visualization-localisation of maps of specific geographical areas.

INTRODUCTION

Following the radical change in mapping practices due to the emergence of the Geographic Information System (GIS) since the 80s, the new approaches to mobile and web mapping and to the use of cartography and geo-referencing have challenged the traditional approaches of knowledge acquisition and teaching. The backdrop of these developments is a series of innovation technologies and the evolution of social practice which have been coined as *geoweb* and *neogeography* within the field of geography (Papadimitriou, 2010; Borruso, 2013a). Neogeography provides a link between geography and digital art and the vectors of this link are the geospatial technologies as well as information and communication technology. The new possibilities connected to Web 2.0 have profoundly changed the role if the user in terms of the generation of contents and interaction (Höhnle et al., 2013).

It is now acknowledged that mobile devices are ever more present in students' lives and geography utilizes smart phones, computers and tablets as a means to collect research data for the production of spatial knowledge, to access web pages that are based on contents related to information about specific localities, and potentially to view guided virtual routes (Arribas-Bel, 2014). Such mobile devices act as physical intermediaries that the students can be trained to use to record, analyze and interpret the world around them. Recent research in geography has explored the creative ways this pervasive tendency of the use of mobile devices in everyday life in the city. Kelley defines these as "implicit pervasive technologies" (Kelley, 2014, p. 837). More than ever before, teachers have the technological devices, even if it is simply one work station, to motivate and involve the students in their learning and, above all, apply new strategies to stimulate the teaching of geography.

The new media bring about significant changes in the way learning takes place. There is a wide gap between how people normally learn and the way in which new generations approach information and knowledge. Digital natives easily adapt themselves to new technological devices and technology because they are not afraid to make mistakes, knowing that they can always return to the previous state (Şahin & Bulut Serin, 2016). In addition, considering the capacity of the brain to continuously remold itself according to the stimuli it receives, it can be hypothesized that the brains of those interacting with technology can be restructured as a consequence of this interaction (Prensky, 2009). In line with this hypothesis some aspects can be highlighted with regards to lesson planning using interactive multimedia: the ability to elaborate in parallel, which entails a more diversified form of concentration; image-illustrating texts; the interaction with the computer generates more active situations than reading which is more passive. It takes on a non-linear organization of information and a problem-solving approach (Prensky, 2001). The key to virtual learning is not much technology itself, but the interaction between the students and the former. Situated learning (Lave & Wenger, 1991) and cooperative learning (Johnson & Johnson, 1999), inspired by a constructivist paradigm, indicate, in fact, a teaching model in which knowledge is co-constructed by the teachers and the students in the same context in which it is applied and is given shape through the interaction among people, instruments, languages and technology.

The construction of content knowledge in geography, thanks to technology, is not understood as uni-directional, from the teacher to the world, but is enriched by relational knowledge (Banini, 2017). This approach is able to represent complex relationships that characterize the reality of such complexity, both on a qualitative and quantitative level. Furthermore, it can be analyzed and delivered in an educational context (Trimarchi, 2012) since such knowledge is produced not only by being concretely in a location, interacting with social actors and economic operators, but also by navigating on interactive sites, blogs and social networks of various local entities or other citizens. Nevertheless, in a formal educational context, the new media are still underrepresented, but very lately the current Minister of Education (Italy) has declared that a ministerial commission will be created to design a set of guidelines on the use of smart phones in class to increase awareness of how these can be utilized effectively in line with educational needs (Zunino, 2017).

CONCEPTUAL DESIGN OF THE WEB-APP

The Geographical and cartographical contents are strongly present in the Web 2.0 and the function of some devices have a lot of potential to improve the teaching of geography and help the students to develop their capabilities (Borruso, 2013b). Google Maps, Google Earth, GeoWeb 2.0, WikiGIS, Youtube, the Social Network and the whole online universe give life to static content knowledge. As Pesaresi outlines “enthusiastic attitudes have been observed among many children, firstly when recognizing the spaces they are familiar with and secondly when exploring places they wish to visit and which they can navigate through in the meantime” (Pesaresi, 2011, p.137). The same nature of Google Earth allows students to explore the planet in a dynamic and interactive way, helping them to understand the concept of local space and to learn in a fun and significant manner (Patterson, 2007). This can act as a support to students to learn about the five themes in geography: position, location, the rapport with the location, movement and regions (Lanegan & Natoli, 1984). Not only does its use support special thinking, it also helps in developing critical analytical competencies and prepares students to use more advanced functions found in a GIS. The various phases of a lesson could actually be developed to aid students in working autonomously in an interactive manner, but at the same time collaborate with each other. A single map in paper form may not be as effective in illustrating a process. On the other hand, digital maps create a more dynamic approach, provide users information regarding a place and increase the level of interaction, thus improving the novice explorer’s experience. For example, the user can see the urban landscape from space as well as from other angles and appreciate the depth through a virtual fly-through (Patterson, 2007). Significant teaching strategies emerge in Google Earth particularly through the existing relationships between physical and anthropic aspects and the analysis of elements that distinguish the different landscapes (Pesaresi, 2007).

The combination of Geospatial Web and the teaching of geography offers students a constructive link between theory and practice. In the didactic field, we want to promote an approach based on blended learning, that is, the effective integration of the two main components (face to face and Internet technology). It represents a fundamental reconstitution and a reorganization of the teaching and learning dynamics, where online learning and knowledge management (by the teacher) blends into a dynamic and meaningful learning experience in which concentrates on building new knowledge (Garrison & Kanuka, 2004).

WEB-APPLICATION GEOMOON

Geomoon is a client/server web application for a stateless environment, i.e. without a memory, which uses the internet. A web app can be defined as an accessible application via web through a network, such as the internet or through an internet network. Therefore, knowing how to program for the web entails knowing the diverse mechanisms and tools to save or pass on data, known as parameters, among the various pages of the web application. Practically, a web-application is a programme that does not need to be installed on the computer since it is made available through an online server and can be used through any web browser (e.g. Google Chrome, Mozilla Firefox, Opera, etc.) in client mode. A link can be created on the desktop of the computer or on the homepage of any mobile device through the addition of a bookmark. A distinctive characteristic is the fact that it puts to fruition pre-established services - in the case of Google applications, examples of these services include the Google Chrome (search engine), G-Mail (webmail service) and Google Maps. In contrast to static websites (HTML), web applications are designed with one or more technologies (PHP, Ajax, Servlet, Database, etc.) which allow the creation of a dynamic site. In other words, a site in which the content of the pages varies according to the interaction. Through a simple web interface, the student has the possibility to visualize, insert, ask for and add the information.

The web-app being proposed is in line with the International Geographic Union (IGU) standards contained within the International Charter on Geographical Education (2016) that states:

“a) As location is a key factor in life, especially in an era of globalization and the internet, geography with its focus on spatial variability provides a very practical and useful perspective on everyday life. b) Geography is the discipline where knowledge about locations and regions has its base. The appreciation of unique contexts and circumstances in an interconnected world helps deepen our understanding of human diversity; c) Geographical knowledge and skills, especially when mediated through geospatial technologies offer unique opportunities to make sense of the modern world” (p.10).

A characteristic of Geomoon is its versatile nature: it is designed for primary school children with the aim of developing their ability in exploring a territory. It can be used for a variety of lessons to trace different routes according to the geographical content knowledge to be taught. The engagement in the game is stimulated by the incentive of finding little Pokemons that act as avatars, inserted in strategic points of interest (Plutino, 2016). Through this game approach (Piaget, 1962; Vygotsky 1967; Martlew et al., 2011), learning can be considered as a participatory approach rather than the compulsory acquisition of knowledge where more effort takes place (Bergen 2009) and favors competency development (Wood & Attfield, 2005). Another aspect of Geomoon consists in a succession of slides, designed specifically to encourage learning, and the assessment and evaluation of learning through a quiz. More specifically, the first step consists in discovering the town of Salerno (Italy) through the interactive geographical map. The interaction of the students with the map is essential to acquire the knowledge and model the conceptions of the location.

The home page of this app consists of three main buttons: Navigate, Explore and Quiz, each of which opens an interface. Under the links a video was inserted of one of the Pokemon episodes to make the children aware of the imaginary world of these characters and enthuse the students towards learning (Fig. 1).



Figure 1. Homepage of Geomoon

The **Navigate** button takes the students to a map of the city of Salerno extracted from My Google maps where three specific points ((Maritime Station, Minerva Gardens and Irno River) highlighted with the icons of the little Pokemons (Fig. 2).

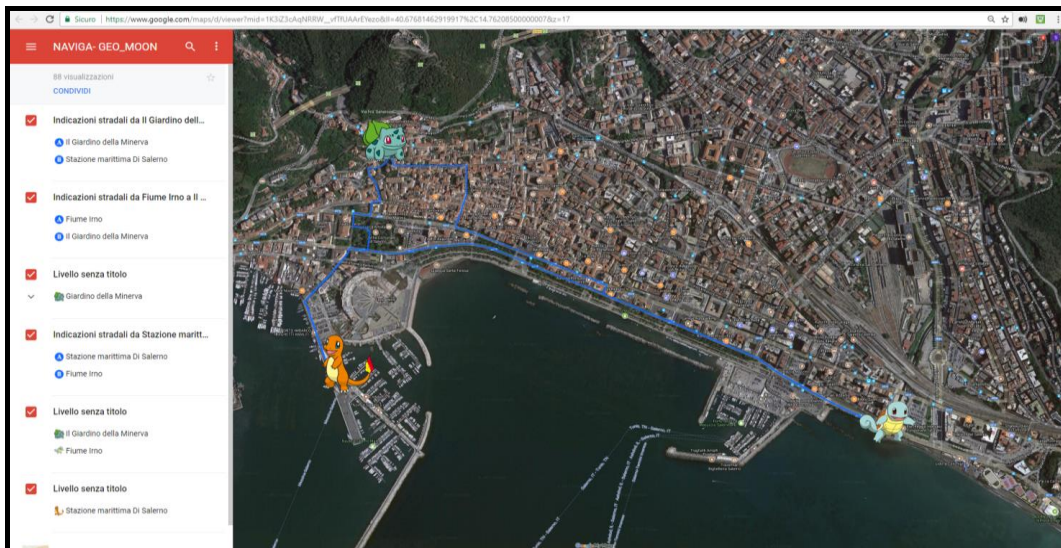


Figure 2. Maps of the city of Salerno with the position of the three pokemon (orange, green and blue) representing the places of the lesson

When clicking on the orange Pokemon the students are virtually taken to the Maritime Station in Salerno (Fig.3) and opening a linked they can see also the commercial port (Fig 4), to understand the different functions: commercial and tourist.

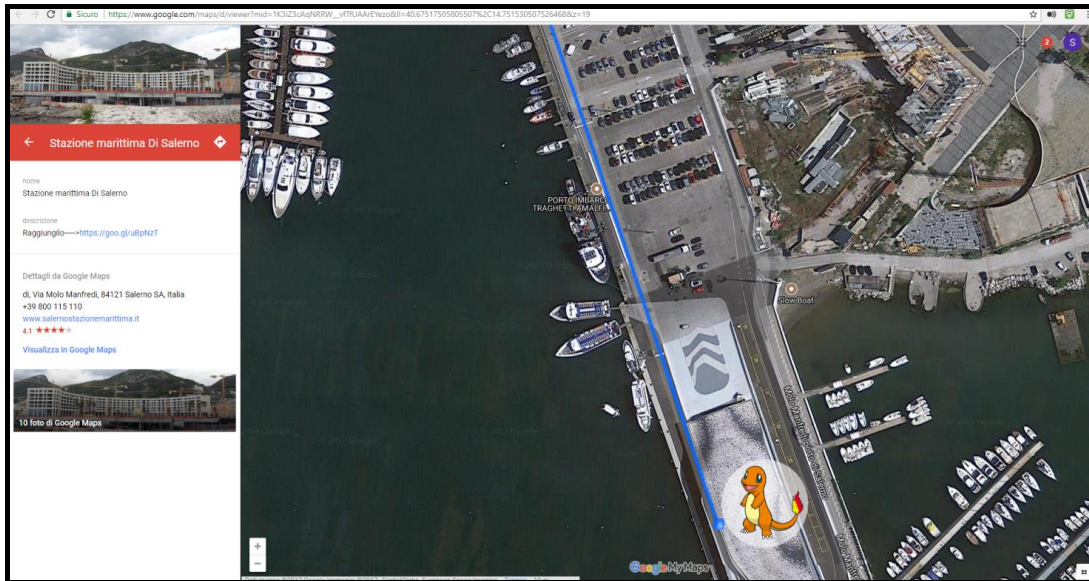


Figure 3. The Maritime Station in Salerno

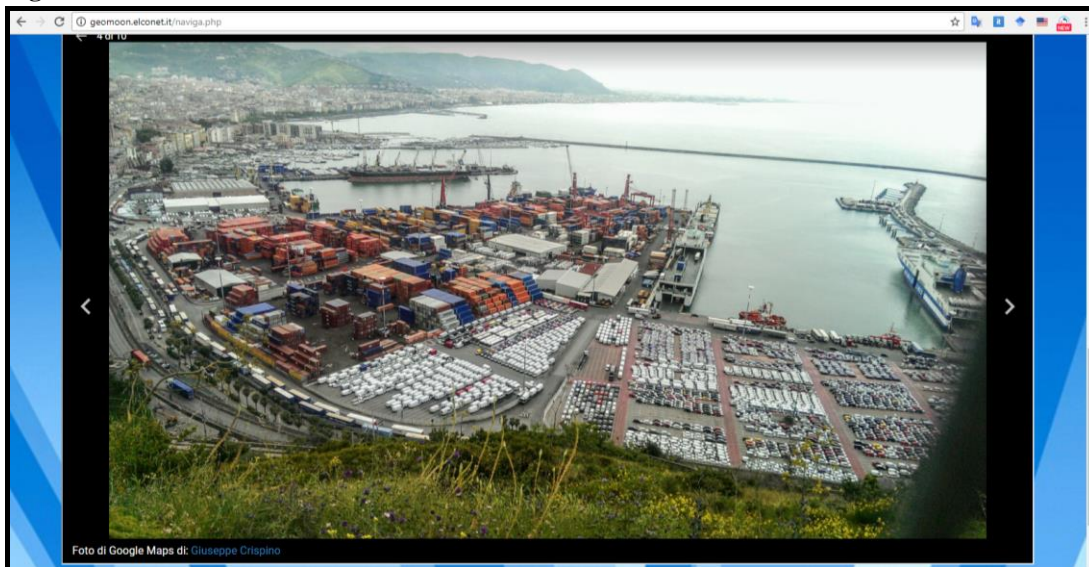


Figure 4. The commercial port and the facilities

Through the link “reach this point” (Fig. 5), starting from the green Pokemon (positioned at the Minerva Gardens), the web-app provides the walking route, or the car and bus options. The visualization of the route is necessary for spatial orientation that spans from daily walks to practical routes. In addition, using the Geospatial Web, the mapping of the location allows students to understand the interdependence of the concepts of space, location, people, the environments in the context of the links between their house, school, family, community and world beyond their neighborhood (Fig. 6).

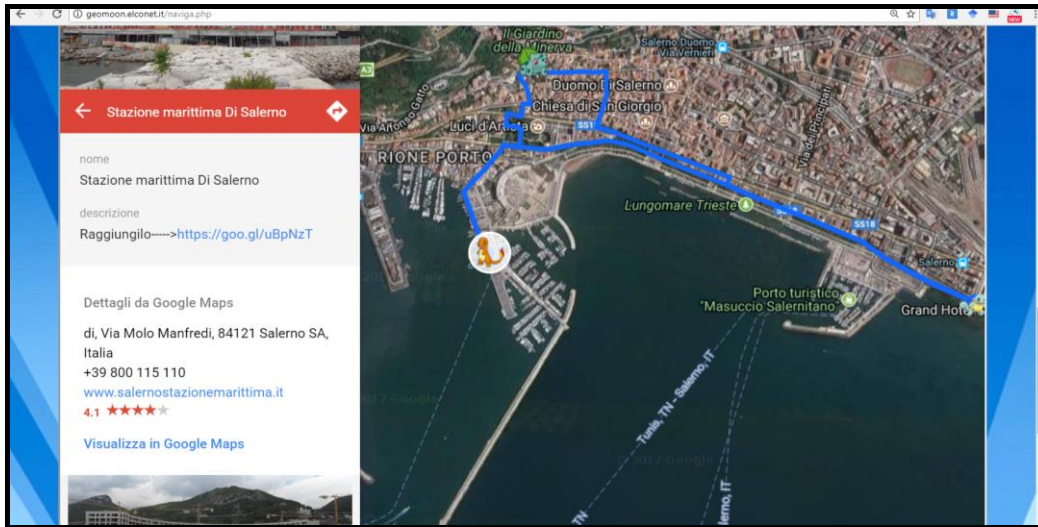


Figure 5. Window display that allows exercise

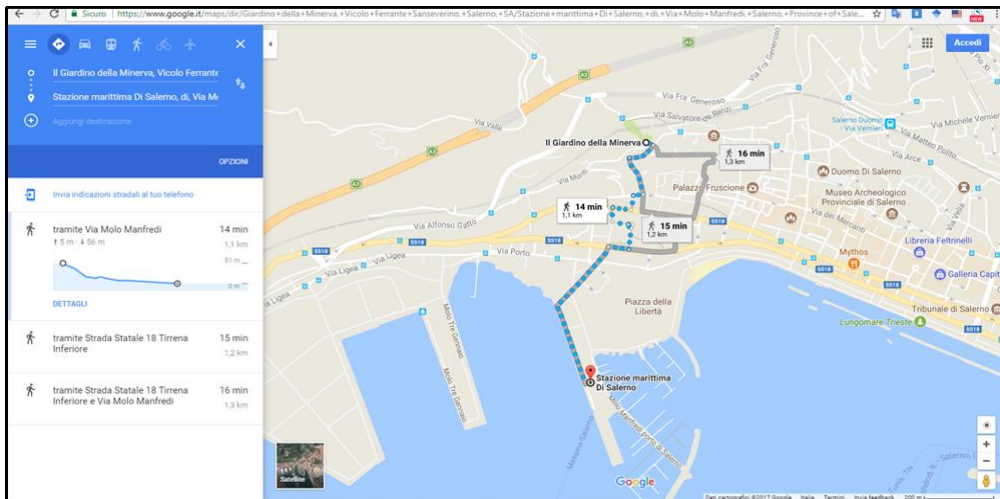


Figure 6. Visualization of the route of Minerva Gardens at Maritime Station

Clicking on the blue Pokemon the students can visualize the route of the river Irno which flows through the town of Salerno (Fig. 7), both on the map and on the satellite (Fig. 8) starting from the river bed to its source. Such visualization helps the students to learn new knowledge.

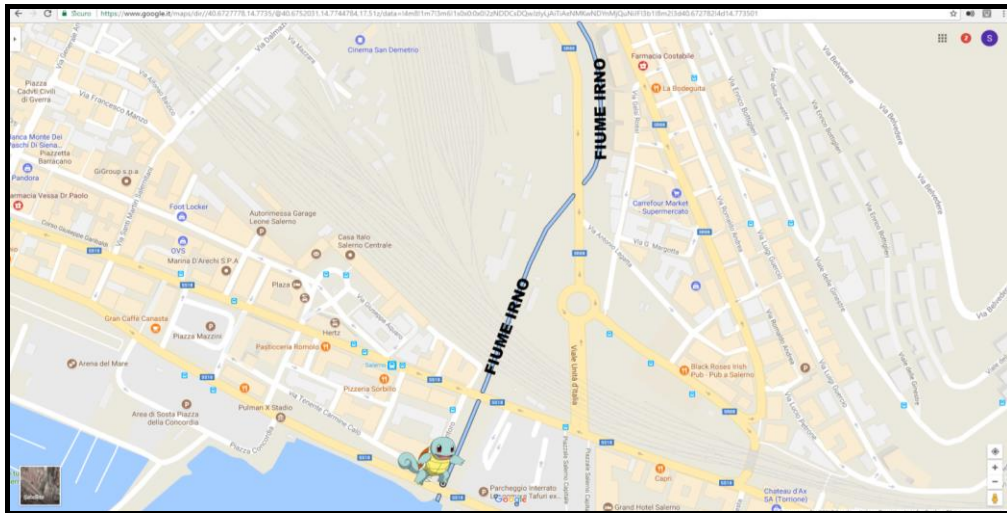


Figure 7. The route of the river Irno

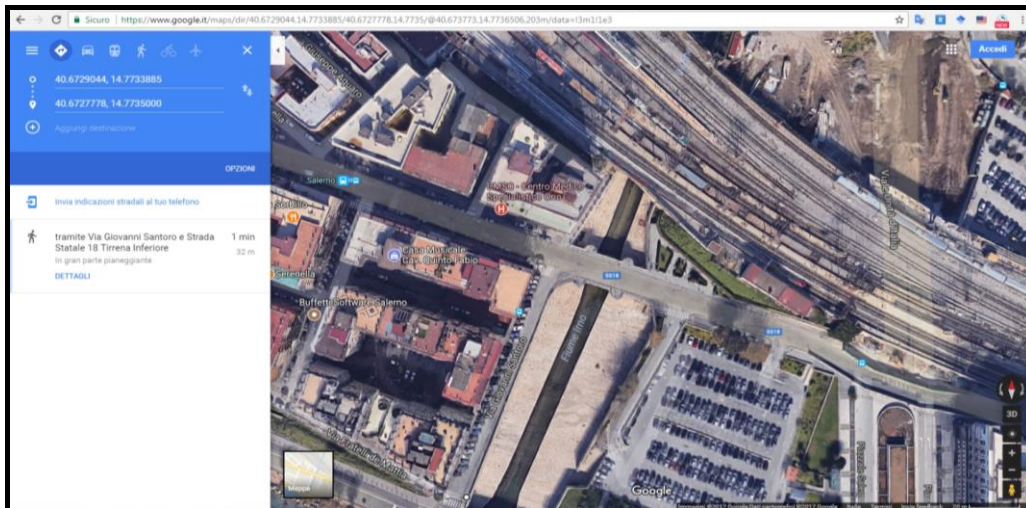


Figure 8. The route of the river Irno on the satellite

With the button – **Discover** – the students open a series of animated slides suitable for the class, with geographical content on the town of Salerno in the diverse aspects of physical, human and economics geography (Fig. 9, 10, 11, e 12).

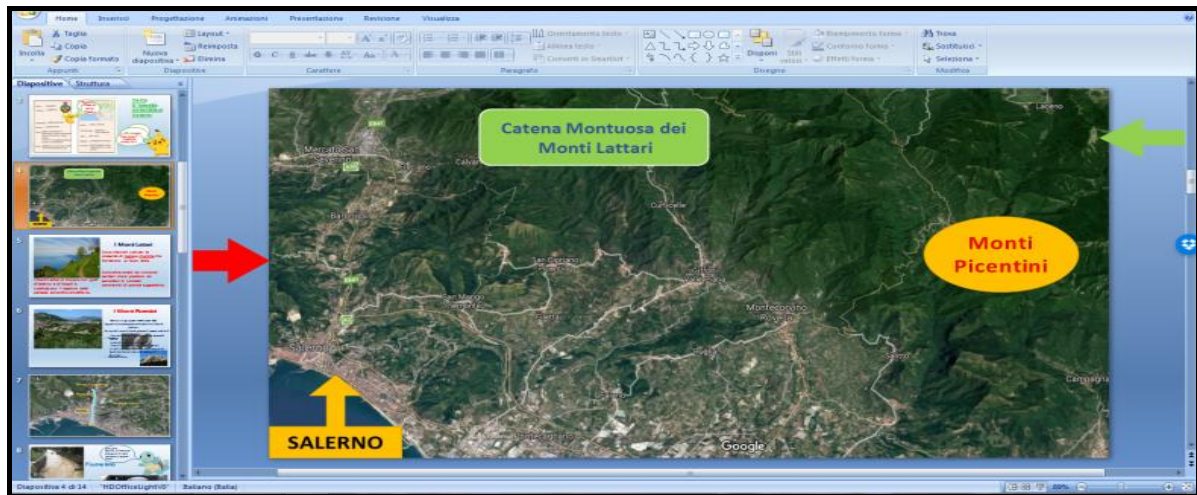


Figure 9. Orography of the territory

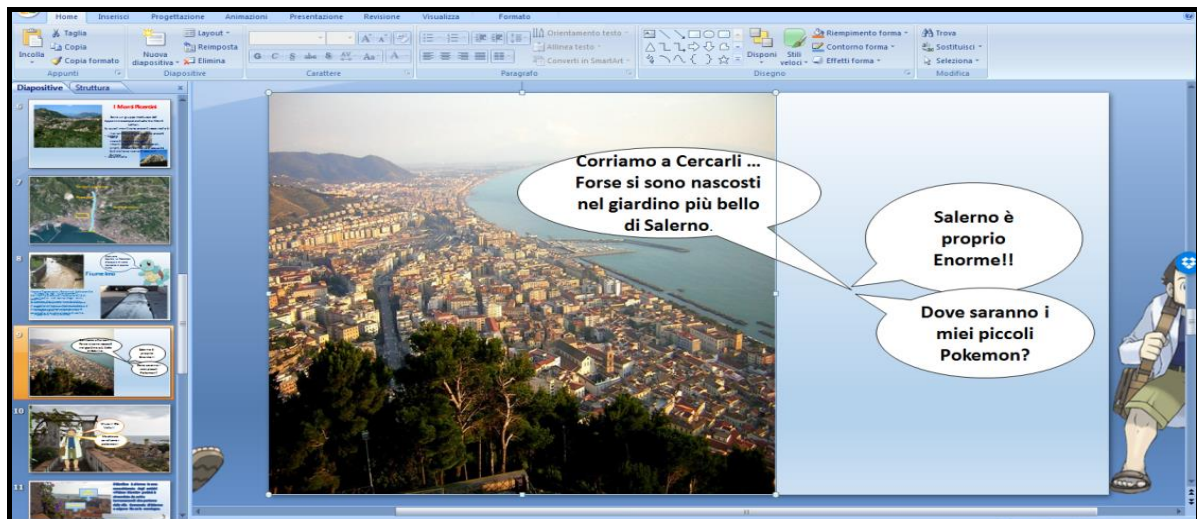


Figure 10. Anthropic aspect of the city



Figure 11. Animated slide on the Irno river

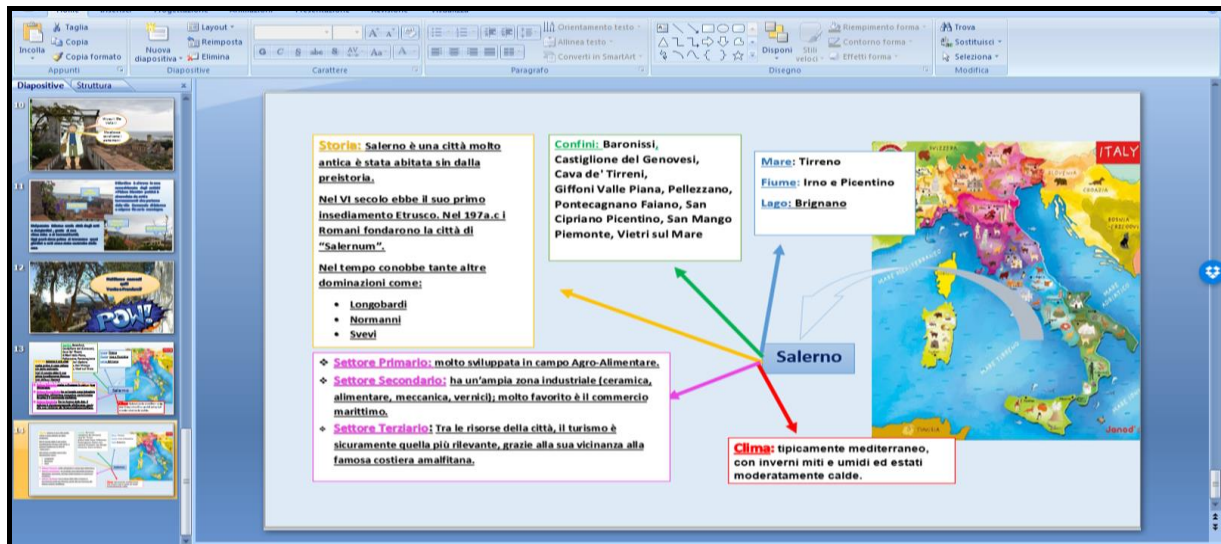


Figure 12. Conceptual map summary

The last interface – **Quiz** – the students can test their knowledge acquisition and geographical competencies about the town of Salerno, by answering a questionnaire containing multiple choice type questions. The results of this quiz is also recorded in the system for the teacher to monitor. It also provides the students with the correct answers when the students make mistakes (Fig. 13).

NAVIGA

SCOPRI

QUIZ

GEO QUIZ

*Required

1. Dove si trova la città di Salerno? * 5 points

☐ a. LAZIO

☐ b. CAMPANIA

☐ c. CALABRIA

2. "Baronissi, Cava de' Tirreni, Giffoni Valle Piana, Pontecagnano Faiano, Vietri sul Mare" confinano con Salerno? * 5 points

☐ a. VERO

☐ b. FALSO

3. Qual è il tipo di clima che caratterizza la città di Salerno? 5 points

☐ a. CLIMA TEMPERATO: temperature moderate, con stagioni ben distinte durante l'anno

☐ b. CLIMA MEDITERRANEO: inverni miti ed estati moderatamente calde

☐ c. CLIMA EQUATORIALE: temperature molto elevate

4. Qual è la principale catena montuosa di Salerno? * 5 points

☐ a. Monti Picentini

☐ b. Monti Lattari e Picentini

☐ c. Monti Lattari

5. Il fiume Irno che attraversa e sfocia a Salerno, dove nasce? * 5 points

☐ a. Fisciano

☐ b. Capezzano- Baronissi

☐ c. Fratte

6. Qual è la densità della popolazione di Salerno? 5 points

☐ a. 50.000 abitanti

☐ b. 100.000 abitanti

☐ c. 140.000 abitanti

7. Da quali popolazioni Salerno fu dominata nell' antichità? 5 points

☐ a. Etruschi, Romani, Longobardi, Normanni e Svevi

☐ b. Greci, Celti, Franchi e Goti

8. Qual è il mare che bagna la costa Salernitana? 5 points

☐ a. Mar Tirreno

☐ b. Mar Ionico

☐ c. Mar Mediterraneo

9. Quale Settore Economico è più sviluppato a Salerno? 5 points

☐ a. Settore Secondario (industria)

☐ b. Settore Terziario (Turismo)

☐ c. Settore Primario (Agro-alimentare)

10. Qual è il giardino da dove si può vedere tutta la città di Salerno? * 5 points

☐ a. Giardino di Era

☐ b. Giardino della Minerva

☐ c. Giardino di Eros

SUBMIT

Page 1 of 1

Figure 13. Questionnaire in Geomoon

CONCLUSIONS

The use of Geomoon in lesson planning and allows the adoption of a learning approach that is more active because the tool helps to facilitate this type of learning. It supports the understanding of many concepts related to geography and helps the students to consider the processes of certain geographical phenomena and their history - an example of this is the fact that the river Irno was buried. It highlights the evolution of technology and how this has contributed to modelling culture (how to identify the changes in population over time and how the improvement in transportation has impacted urban development). In the educational field, with the use of this app, the aim is that of promoting a blended learning approach.

Within this context, from an educational point of view, the teacher's role of mediation is very important as it allows access to new technology based on a critical approach aimed not only at learning how to use the tool, but also at understanding the cultural, social and political implications that its use brings about.

Geographic maps is a fundamental tool in geography “is like a very weird bestiary, but also a world that the child discovers with all the strength of his own intelligence in training, with words to express concepts, scales and numbers to count” (Frémont, 2007, p. 47) necessary for a spatial orientation that goes from daily routines to imaginative dream / desire pathways to practical reality. It must become a family member from the early years of schooling, a facilitator to store the notions and gain mastery of reading and interpretation. Using this web app would allow them to approach it with less detachment and more enthusiasm.

Nowdays, Geomoon is in the beta-release version, and it works on Microsoft Explorer, Safari, Chrome, Firefox and Opera on PC and Mac. Future research will focus on the effective capacity of the tool to foster the learning processes following the exposed criteria. To achieve this aim, the tool will be used, during future works, in Italian school's classrooms by teachers and students without the supports of researchers.

ACKNOWLEDGEMENTS

All authors were directly involved throughout the research project: Antonina Plutino, is directly responsible for the conception, design and drafting of the work, Stefano Di Tore participated in investigating the themes of the research, and Flora Ippolito was involved in the development of the web-app.

NOTES ON CONTRIBUTORS

Antonina Plutino is an Assistant Professor of Geography at the University of Salerno, Italy. Her research interests are in the landscape, territorial identity, emotional Geography and didactics of geography.

Stefano Di Tore is a researcher at the University of Salerno. His research interests focus on the potential of technology in inclusive educational contexts.

Flora Ippolito holds a Degree in Education

REFERENCES

- Arribas-Bel, D. (2014). Accidental, open and everywhere: Emerging data sources for the understanding of cities. *Applied Geography*, 49: 45-53.
- Banini, T. (2017). Produrre e trasmettere conoscenza geografica in epoca digitale. Alcune considerazioni e qualche interrogativo. *Semestrare di Studi e Ricerche di Geografia*, 1, 29-40.
- Bergen, D. (2009). “Play as the Learning Medium for Future Scientists, Mathematicians, and Engineers.” *American Journal of Play*, 1 (4), 413-428. [Google Scholar]
- Borruso, G. (2013a). Cartografia e informazione geografica “2.0 e oltre”, webmapping, webgis. Un'introduzione. *Bollettino dell'Associazione Italiana di Cartografia (AIC)*, 147, 7-17.
- Borruso, G (2013b). Web 2.0 and Neogeography. Opportunities for teaching geography, *Journal of Research and Didactics in Geography (J-READING)*, 2(2), 43-55.
- Frémont, A. (2007). *Vi piace la geografia*. It.Ed. D. Gavinelli, Roma: Carocci.
- Garrison, D. R. & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7 (2), 95-105.
- Höhnle, S., Michel B., Glasze, G. & Uphues, R. (2013). Digital geodata traces – new challenges for geographic education. *International Research in Geographical and Environmental Education*, 22 (2), 97-108.
- International Charter on Geographical Education, (2016), IGU Commission on Geographical Education, in http://aiig.it/wp-content/uploads/2016/10/IGU_2016_def.pdf (14.08.2017).
- Johnson D.W., and Johnson R., (1999). *Learning together and alone. Cooperative, competitive, and individualistic learning*, Boston: Allyn & Bacon.
- Kelley, M.J. (2014). The Semantic Production of Space: Pervasive Computing and the Urban Landscape. *Environment and Planning A*, 46(4), 837-851.

- Lanegran, D. A. & Natoli, S. (1984). Guidelines for Geographic Education in the Elementary and Secondary Schools. In *Association of American Geographers*. [Google Scholar]
- Lave, J. & Wenger, E. (1991). *Situated Learning. Legitimate peripheral participation*, Cambridge: Cambridge University Press.
- Martlew, J., Stephen C., & Ellis J. (2011). Play in the Primary School Classroom? The Experience of Teachers Supporting Children's Learning Through a New Pedagogy. *Early Years*, 31 (1), 71–83. [Taylor & Francis Online], [Google Scholar]
- Papadimitriou, F. (2010). A “neogeographical education”? The geospatial web, GIS and digital Art in adult education. *International Research in Geographical and Environmental Education*, 19 (1), 71–74. [Taylor & Francis Online]
- Patterson, T. C. (2007). Google Earth as a (Not Just) Geography Education Tool, *Journal of Geography*, 106 (4), 145-152.
- Pesaresi, C. (2011). Una nuova didattica e una nuova geografia con le tecnologie. In G. De Vecchis (Ed), *A scuola senza geografia?* (pp.133-143). Roma: Carocci.
- Pesaresi, C. (2007). Google Earth e Microsoft Live Maps nella didattica della geografia. Uno zoom su alcuni paesaggi italiani. *Ambiente, Società e Territorio. Geografia nelle Scuole*, 6, 40-41.
- Piaget, J. (1962). *Play, Dreams and Imitation in Childhood*. New York: Norton. [Google Scholar]
- Plutino, A. (2016). La lezione di geografia in chiave semplessa, *Scuola Italiana Moderna*, 3 (124), 74-75.
- Prensky, M. (2001). *Digital game-Based Learning*. NY: McGrawHill.
- Prensky, M. (2009). H. Sapiens Digital: From Digital Immigrants and Digital Natives to Digital Wisdom: <http://www.wisdompage.com/Prensky01.html>, (14.06.2017).
- Şahin, Z. & Bulut Serin, N. (2016). Effect Of Education To Society Culture In The Digital Age. *The Turkish Online Journal of Educational Technology (TOJET). Special Issue for IETC, ITEC, IDEC, ITICAM 2016 – July 2016*, 198-204.
- Trimarchi, R. (2012). Geografia, didattica e nuove tecnologie. *Annali della facoltà di Scienze della formazione Università degli studi di Catania*, 2, 245-262.
- Vygotsky, L. S. (1967). “Play and its Role in the Mental Development of the Child.” *Soviet Psychology* 5 (3): 6–18. [Taylor & Francis Online], [Google Scholar]
- Wood, E., Attfield, J. (2005). *Play, learning and the early childhood curriculum*, 2nd ed., London: Paul Chapman. [Google Scholar]
- Zunino, C. (2017, 12 settembre). Svolta della ministra Fedeli: "Smartphone in aula a scuola. Dico sì, sono un aiuto". *Repubblica.it*, http://www.repubblica.it/scuola/2017/09/12/news/la_svolta_della_ministra_smartphone_in_aula_dico_si_sono_un_aiuto_-175262917/

Development of Printed Media with Augmented Reality Technology for the Farmers in Rural Areas Nakhon Nayok Provinces, Thailand

Paitoon SRIFA

*Department of Educational Technology, Faculty of Education
Kasetsart University, Bangkok Thailand
feduptsf@ku.ac.th*

Wilaiporn POOKEAMKAM

*Department of Educational Technology, Faculty of Education
Kasetsart University, Bangkok Thailand
g5714650956@ku.ac.th*

ABSTRACT

The printed media is quickly developing, but they are also giving birth to the newer printed media using the internet, smart devices, and applications. Internet networks are often used together with smart devices and applications for easy portability of applications at all times and all places, particularly the use of agricultural field and far away in rural areas. The purpose of this research was to development of printed media by using Zapparr Augmented Reality (AR) Technology in the title of "Watermelon" for farmers in the " Nakhon Nayok " provinces , located in the center part of Thailand , and to study the use of printed media , reviews the benefits and problems of the use of print media in each category . The sample of the sampling using stratified random with a total of 66 farmer households. The results showed that development of printed media with Augmented Reality (PMAR) quality is a good level. The farmers choose to use a printed media type as a poster satisfaction with very good level, brochure satisfaction in the good level and flash card satisfaction in good level. The benefits of new printed media with augmented reality technology simplifies rather than reading from the traditional printing media. The farmers can use mobile phones with Zapparr application to scan through new printing media for watching videos, presentation, soundtrack, and data links from external sources and also watch as many times as needed, however, there are problems with using smart devices and the internet in some countryside.

Keyword: Printed media, Augmented Reality, AR, Zapparr, Smart Devices, Mobile phone, Application, Rural Area

INTRODUCTION

Thailand is located in the tropical, can farm all year around. Most of the area is used for agriculture approximately 15% of the vegetable area is planted with watermelon, which is the most popular plant in Thailand. The problem is watermelon plantation is still using traditional planting methods that can only be grown seasonally and cannot increase productivity. It is, therefore, necessary to promote and educate farmers through new printed media. Recent advances in hardware and software for mobile computing have enabled a new breed of mobile Augmented Reality (AR) systems and applications. A new breed of computing called augmented ubiquitous has resulted from the convergence of wearable computing, wireless networking, and mobile AR interfaces (Papagiannakis, G, 2008). AR technology contributes to increasing engagement, invites participation and develops the appreciation of the context, proposed to incentivize curiosity, facilitate the interpretation of text and illustrations and provide a learning tool that relates to the reader (Garcia-Sanchez, J.C., 2017). AR helps to concretize abstract concepts and enhances the sense of reality which in turn is a huge contribution to learning (Özdemir, Muzaffer, 2017). AR-based video telephony service can allow mobile users a better user experience since it allows participants to place and transmit augmented objects on video frames to a peer (Jang, S.B., 2017). Normally, there is no interaction with the traditional printed media such as having only data and images users will not have access to the information detailed, but the new modern printed media combined with AR Technology can make a moving picture like a video and easy to understand, keep up to date. Therefore, it is urgent to improve and transform the process of developing traditional media into new printed

STUDY

This research study aims to (1) Develop interactive printed media for Watermelon by using augmented reality (AR) technology. (2) Study what the appropriate printed media is used for watermelon rural farmers areas in Nakhon Nayok Province, Thailand. (3) Reviews the benefits and problems of using AR printed media. The research methodology is a qualitative research study by using participant observations, questionnaires and documents. The sample of sampling using stratified random with a total of 66 farmer households. In this research the definitions of Printed Media with Augmented Reality (PMAR) Technology are using smart devices and Zappar technology. There are varieties of equipment such as mobile phone both iOS and android Operating System, internet, networking, application and printed media with augmented reality (PMAR) are focused to: Poster, Brochure, and Flash Cards. (Fig. 1, 2, 3) For the PMAR graphics design using Photoshop, Illustrator and After Effect Programs. The user process is simple to download free Zappar app which opens up a camera view in "scanning" mode, when using an AR browsing app on to browse augmented content the distance users preferred to stand from poster content was 129 cm and that standing further from the poster enabled a browsing task to be completed more quickly (Colley, A. 2016). Once the app detects something that's Zappar powered it assembles all the content and brings that thing to life on-screen.



Fig. 1 Types of PMAR: Poster size 29.7 cm x 42 cm

The farmer's samplings can use mobile phones with the installed Zappar application and scan point of the Zappar Code to access and get the more information on videos (Fig. 1.1) about: –Where is watermelon come from? (Video1) - Planting preparation. (Video2) -Watermelon seeds preparation. (Video3) -Planting and maintenance. (Video4) and -Watermelon harvest. (Video5)

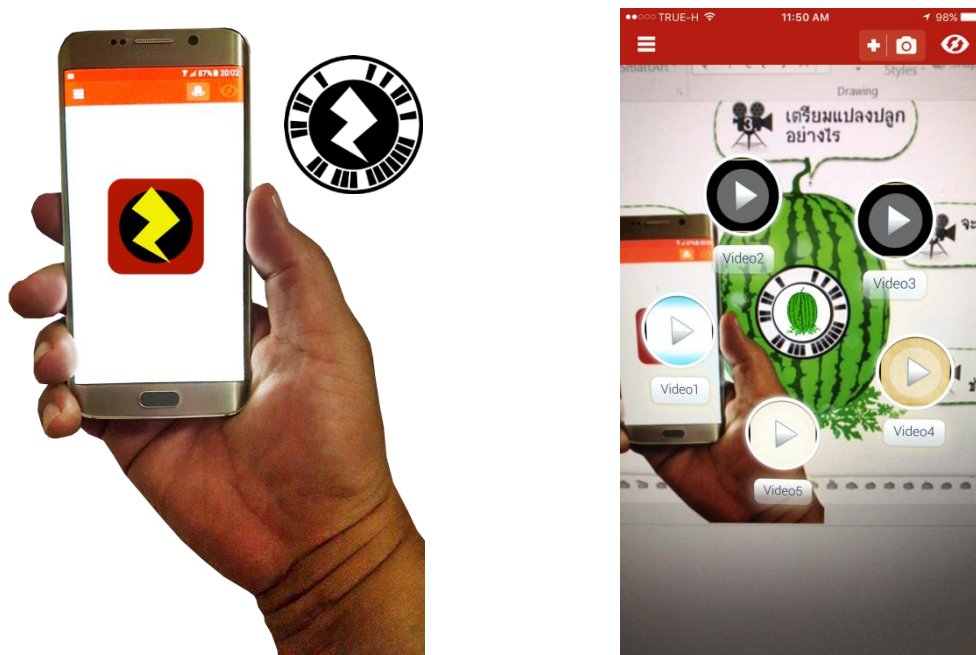


Fig. 1.1 Using Zappar app to scan Zappar Code



(Brochure Front size)



(Brochure Back size)

Fig. 2 Types of PMAR: Brochure size 21 cm x 42 cm



Fig.3 Types of PMAR: Flash Card size 5.5 cm x 9 cm

The Zappar has augmented reality application that can see and recognize code, images, and objects. Ever wondered how you know what to zap? Then wonder no more. Now, whenever you see a Zappar Code (Fig. 3.1) you know there's exciting hidden content to discover can appear on about video and a whole bundle of mind-blowing fun to mobile phones.

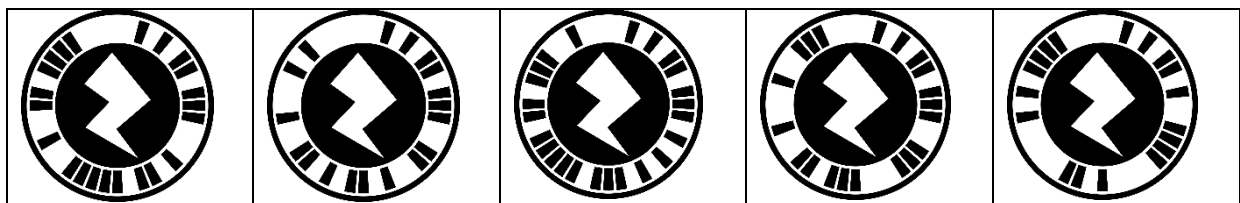


Fig. 3.1 Zappar code for each Flash Card (1-5)

FINDINGS

The results showed that development of printed media with AR quality are a good level. The farmers choose to use a printed media type as a poster satisfaction with very good level, brochure satisfaction in good level and flash card satisfaction in good level. The benefits of new printed media with Augmented Reality Technology simplify rather than reading from the traditional printing media. The farmers like and love to use poster the most of all, because of big visualize with data, including graphics and video clips, continues with brochure and flash card. The brochure included information consisting of text and images, non-interactive and if updated, the brochure will be obsolete with the advent of augmented reality technology, Mobile Augmented Reality has been introduced to facilitate human in their daily lives (Zulkifli, A.N. 2016). The flash card introduces the interaction of learning therefore it could create the joyful learning. However, the potential for the flash card could be further enhanced through the use of AR technology. Therefore, introducing the use of AR could encompass fun learning since AR offered rich media learning (Rambli, D.R.A., 2013). The farmers know how to use modern technology better and get more information on the media. Be able to visualize and hear the voice description and follow step by step through a mobile phone. It is easy to use and can be used in everyday life. However, there are problems with using smart devices and internet in some countryside. The problem of using PMAR found that the farmers' lack of AR knowledge, experience, equipment for using in PMAR environments, internet networks in the rural areas and have not the new printed media to use.

CONCLUSIONS

To study the development of Printed Media with Augmented Reality Technology (PMAR) is the new ways of life for the farmers in rural areas. This is the new activities for sharing the exclusive knowledge and educated for them to upgrade ways of life about planting melon and the other plants in Thailand. Augmented Reality is changing the ways to interact with the world. However, the farmer must have a good attitude towards using the new technologies; provide equipment's and knowledge resources as well as the new modern farming. The urgent priority is the government should support and provide internet access in all areas of the country.

ACKNOWLEDGMENT

This research paper could not have been done without the support of the Educational Technology Department, Kasetsart University Bangkok Thailand. Thank you for knowledge and education about Augmented Reality Technology from website <https://www.zappar.com>

REFERENCES

- Colley, A., Lappalainen, T., Määttänen, Schöning, J., Häkkinä, J.a (2006). *Crouch, Hold and engage: Spatial Aspects of augmented reality browsing*. ACM International Conference Proceeding Series, Volume 23-27-October-2016, Conference on Human-Computer Interaction, NordiCHI 2016; Lindholmen Congress Center Gothenburg; Code 124606.
- Garcia-Sanchez, J.C. (2017). *Augmenting Reality in Books: A Tool for Enhancing Reading Skills in Mexico*. Publishing Research Quarterly Volume 33, Issue 1, 1 March 2017, Pages 19-27.
- Jang, S.B., Kim, Y.G., Ko, Y.-W. (2017). *Mobile video communication based on augmented reality*. Multimedia Tools and Applications, Volume 76, Issue 16, 1 August 2017, Pages 16893-16909.
- Özdemir, Muzaffer. (2017). *Educational augmented reality (AR) applications and development process*. Mobile Technologies and Augmented Reality in Open Education, 22 February 2017, Pages 26-53.
- Papagiannakis, G., Singh, G., Magnenat-Thalmann, N. (2008). *Computer Animation and Virtual Worlds*. Volume 19, Issue 1, February 2008, Pages 3-22.
- Rambli, D.R.A., Matcha, W., Sulaiman, S. (2013). *Fun learning with AR alphabet book for preschool children*. Procedia Computer Science, Volume 25, 2013, Pages 211-219, International Conference on Virtual and Augmented Reality in Education, VARE 2013; Puerto de la Cruz, Tenerife; Spain; 7 November 2013 through 9 November 2013; Code 101459.
- Zulkifli, A.N., Alnagrat, A.J.A., Mat, R.C. (2016). *Development and evaluation of i-Brochure: A mobile Augmented reality application*. Journal of Telecommunication, Electronic and Computer Engineering Volume 8, Issue 10, 2016, Pages 145-150.

Digital Teacher Competence

María Luz CACHEIRO-GONZÁLEZ

School of Education

Universidad Nacional de Educación a Distancia (UNED)

Madrid, Spain

mlcacheiro@edu.uned.es

Cristina SÁNCHEZ-ROMERO

School of Education

Universidad Nacional de Educación a Distancia (UNED)

Madrid, Spain

Jesús Manuel GONZÁLEZ-LORENZO

School of Education

Universidad Nacional de Educación a Distancia (UNED)

Madrid, Spain

ABSTRACT

The acquisition and updating of digital teacher competence is a requirement in the knowledge society. There are many possibilities offered by ICT for teacher training. A typology of web resources is presented based on information (general video channels, ...), collaboration (blog, wiki, ...) and learning (ePortfolio, PLE, educational video channels, ...) categories, that can help to plan the teaching practice. Several proposals have been made to systematize the levels of acquisition of digital teacher competences: ICT Competency Standards for Teachers (ICT-CST) (UNESCO, 2008), and ICT Competencies' Pentagon (MEN, 2013). In addition, teachers have at their disposal a variety of technopedagogical models for the technology integration in educational contexts, like for example: Technical, Pedagogical and Content Knowledge Model (TPACK) (Mishra & Koehler, 2006), and Substitution, Augmentation, Modification and Redefinition Model (SAMR) (Puentedura, 2014). Finally, some strategies with ICT Resources are proposed to be implemented in distance learning contexts.

INTRODUCTION

Digital competence has been defined by Ala-Mutka (2011, p. 3) as the “confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society”. The digital competence can be developed through five underlying concepts (Cobo, 2009, p. 20): *E-awareness* (user's awareness of ICT and appreciation of the relevance of these ICT in the information based society), *Technological literacy* (critical use of electronic media for study, work, leisure and communication), *Informational literacy* (ability to understand, assess and interpret information from all kinds of sources), *Digital literacy* (proficiency to build new knowledge, based on the strategic employment of ICT for search, access, management, creation and communication) and *Media literacy* (understanding how the traditional mass media and the digital media are merging).

Some of the skills related to digital literacy (Cobo, 2009, p. 22) are: *definition* (using ICT tools to search, find, identify and recognize the information need); *access* (knowing how to collect and/or retrieve information in digital environments and the ability to develop a search strategy to locate information from different sources); *management* (organizing information into one or more classification schemes); *creation* (generating new information and knowledge by adapting, designing, editing, inventing, or representing information in ICT environments) and *communication* (conveying information and knowledge to various individuals and/or groups).

Digital teacher competence is defined throughout the domain of the different areas: Information processing, Communication, Content creation, Problem solving and Security (Ferrari, 2013, and Vuorikari, Punie, Carretero & Van den Brande, 2016) [Figure 1].

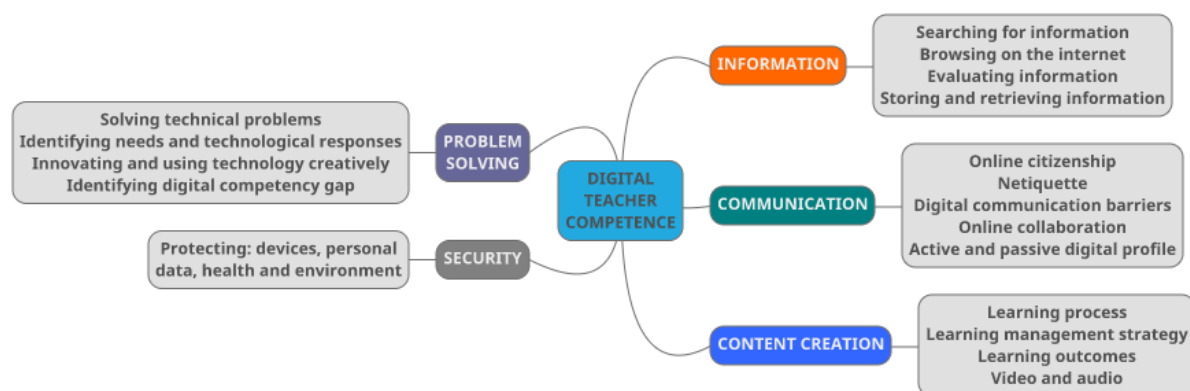


Figure 1: Digital Competences for Teachers (based on Vuorikari et al, 2016)

The different components of the digital teacher competence can be developed through an online course on Moodle platform created under the DigiComp project offering the opportunity to complete all the tasks in the five competences to obtain a certificate.

After that select with which competence you would like to start. Complete all the tasks in the five competences and submit and grade your final coursework and earn your DIGICOMP certificate.

Some items to self-assessment of the digital teacher competence for a proficient user are presented as follows [Table 1].

Table 1: Digital competences - Self-assessment grid - Proficient user (item examples)

Competence area	Description
Information processing	I can assess the validity and credibility of information using a range of criteria. I can save information found on the internet in different formats. I can use cloud information storage services.
Communication	I actively use a wide range of communication tools (e-mail, chat, SMS, instant messaging, blogs, micro-blogs, social networks) for online communication. I actively participate in online spaces and use several online services (e.g. public services, e-banking, online shopping). I can use advanced features of communication tools (e.g. video conferencing, data sharing, application sharing).
Content creation	I can produce or modify complex, multimedia content in different formats, using a variety of digital platforms, tools and environments. I can use advanced formatting functions of different tools (e.g. merging documents of different formats, using advanced formulas, macros). I know how to apply licenses and copyrights.
Problem solving	I am aware of new technological developments. I understand how new tools work. I frequently update my digital skills.
Safety	I frequently check the security configuration and systems of my devices and/or of the applications I use. I can configure or modify the firewall and security settings of my digital devices. I can apply filters to spam e-mails. I make reasonable use of information and communication technology.

Source : <http://europass.cedefop.europa.eu/resources/digital-competences>

The acquisition and updating of digital teacher competence is a requirement in the knowledge society. Students for education major consider the intensive use of digital technologies as one of the necessary skills for them and their teachers (Campos & Solano, 2017).

The ICT Competences and Standards Model from the pedagogical dimension (Valencia et al, 2016) presents three levels of appropriation of ICT: Integration, Re-orientation and Evolution, which are broken down into three elements: Know, Use and Transform. This model proposes a training route that consists on five phases: (1) Assessment of the level of appropriation of ICT in educational practices, (2) Reflection and instruction in the use of ICT for the promotion of (3) Guided use of ICT-supported educational practices; (4) Review of the results of the implementation of ICT-supported educational practice; and (5) Systematization of educational practices supported by successful ICT.

Different typologies, standards, and models for digital teacher competence has been select to allow teachers to design and evaluate didactic strategies according to their educational context. These theoretical proposals orient the teachers in the approach from different levels, from educational policies, through the guidelines for ICT initial and continuing training plans.

1. WEB RESOURCES TYPOLOGY

There are many possibilities offered by ICT for teacher training. We outline a proposal for classifying web resources on information, collaboration and learning, although in practice we will find educational hybrid configurations [Figure 2].

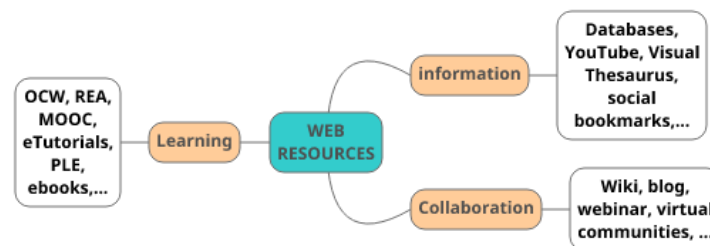


Figure 2: Web resources typology (Cacheiro, 2011)

This classification enables instructional designers to develop exemplifications, while the same resource can be used for different purposes and therefore can be included in more than one category.

1.1. Web Information Resources

Web resources provide additional information to address a topic from basic to advanced levels. Some Web Information Resources include: webgraphy, virtual encyclopedias, online databases, or web 2.0 tools. Web 2.0 tools enable the user to browse, create and share documents containing information on a subject through resources in various formats, including texts, videos, and graphic presentations.

Some tools that facilitate this task are social bookmarks such as del.icio.us, that allow the creation and sharing of resources indexed by labels or tags. Video repositories such as YouTube, allow the upload of videos or audio recordings on various topics. Graphic presentations as prezi, which facilitates the consultation of presentations of different subjects of congresses or workshops.

1.2. Web Collaboration Resources

Web resources for collaboration offer users the opportunity to participate in professional networks and co-create resources. Collaborative work allows the assessment of existing resources and their creative use in collaborative learning contexts. Some collaborative web resources are discussion groups and collaboration web 2.0 tools such as wikis and blogs. Webinar is a widely-used tool for organizing online seminars. Distribution lists allow the receipt of regular information through email about events, articles, links based on the theme of the lists to which the user has subscribed. Collaborative groups offer a web space where those interested in a particular topic are able to reflect through thematic forums and share documents. Wikis and blogs are two examples of web 2.0 collaborative tools that offer an intuitive way to create content and shared thoughts on each subject area of interest. Seminars on the web (Webinar) afford the opportunity to participate in real-time seminars on the network and to view them later offline.

1.3. Web Learning Resources

Web resources for learning offer various forms of work with content and activities. An integrated design of learning resources is an important part of the instructional process that helps achieve the expected learning outcomes. Some web learning resources are repositories of educational resources, interactive tutorials, web 2.0 tools (e.g., eBooks, podcasts) and open online courses (OCW, OER, MOOC). Repositories of educational resources offer a variety of teaching materials created by educators, researchers, students, and educational institutions (e.g., Merlot, Agregga) composed of content units with activities and evaluation tests. Interactive tutorials allow one to process guided presentations using text, graphics and audio. Some web 2.0 tools facilitate the use of educational electronic books (eBooks) or audio classes on the Internet [podcast] on the subject that is being addressed, enabling users to create their own productions. OCW (Open Course Ware) is a source of online courses, offers content resources that have been used in classroom. This type of course is consistent with the OER (Open Educational Resources) initiative to provide freely available educational resources on the Web through Creative Common licenses, a resource for authors wishing to protect their intellectual property. MOOC (Massive Open Online Courses) offer the opportunity to update knowledge for teachers in a broad content areas.

1.4. Teaching and Learning with ICT Resources Proposal

As a working proposal for the teacher, we present a conceptual map for teaching and learning with ICT resources, integrating information, collaboration and learning web tools [Figure 3].

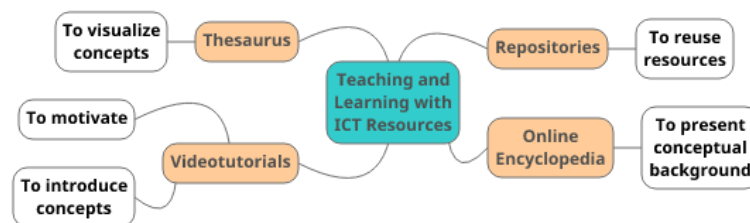


Figure 3: Teaching and Learning with ICT Resources (Own elaboration)

ICT resources can be useful for different purposes throughout the teaching-learning process: to visualize concepts (thesaurus), present conceptual background (online encyclopedia), to motivate (videotutorial), etc.

ICT resources can also favor teaching-learning processes at different times: at the beginning, during and at the end of the training sessions.

2. ICT STANDARDS FOR TEACHERS

Several proposals have been made to systematize the levels of acquisition of ICT competences by teachers: ICT-CST UNESCO (2008) or ICT Competencies' Pentagon (MEN, 2013).

2.1. ICT Competency Standards for Teachers (UNESCO, 2008)

The ICT Competency Framework Standards for Teachers (UNESCO, 2008) offer an opportunity to plan different levels to implement digital teacher competences: Technology literacy, Knowledge Deepening, and Knowledge Creation [Figure 4].

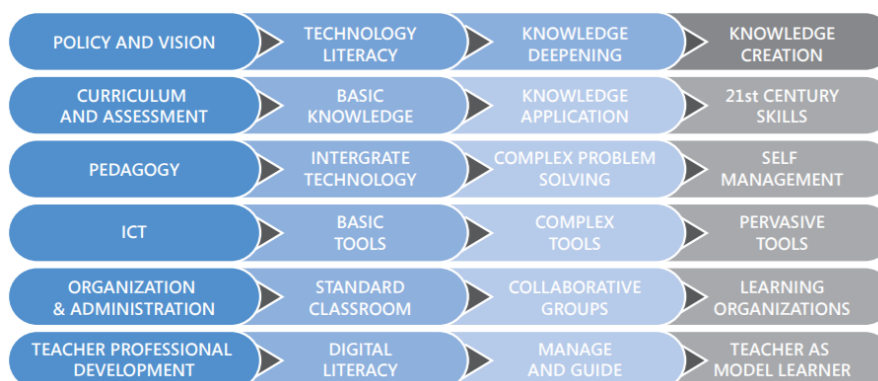


Figure 4: ICT Competency Framework for Teachers (UNESCO, 2008).

This framework is based on previous studies as the International Society for Technology in Education (ISTE) and includes three modules which offer an opportunity to plan different strategies to implement ICT Competences for Teachers:

- *Technology literacy*. Teachers should be able to identify the components of education reform programs that correspond to the policy goals.
- *knowledge deepening*. Teachers should be able to design classroom activities that advance the policy goals.
- *Knowledge creation*. Teachers should be able to develop programs within their school that advance the policy goals.

These three strategies are applied in different modules: (1) understanding ICT in education, (2) curriculum and assessment, (3) pedagogy, (4) ICT, (5) organization and administration, and (6) teacher professional learning. Following this standard, a teacher who wants to develop the “knowledge creation” strategy apply to their “teacher professional learning” will be able, among other competences “to design ICT-based learning resources and environments (...); support students’ continuous reflective learning; and create knowledge communities for student and colleagues” (UNESCO 2011, p.14).

This framework tries to represent the complexity of the educational context including the key components (curriculum, pedagogy, and technology), from different educational perspectives (academic and organizational), offering a framework to introduce educational technology in training institutions. A matrix of 18 different configurations can be adopted by stakeholders. This European proposal has been complemented by researcher initiatives as Churches (2009) who present a selection of web resources to help for the implementation of each configuration of the different modules of the standar.

2.2. ICT Competencies’ Pentagon (MEN, 2013)

The ICT Competences for Professional Teacher Development can be classified in: technological, communicative, pedagogical, management and research (MEN, 2013) [Figure 5].

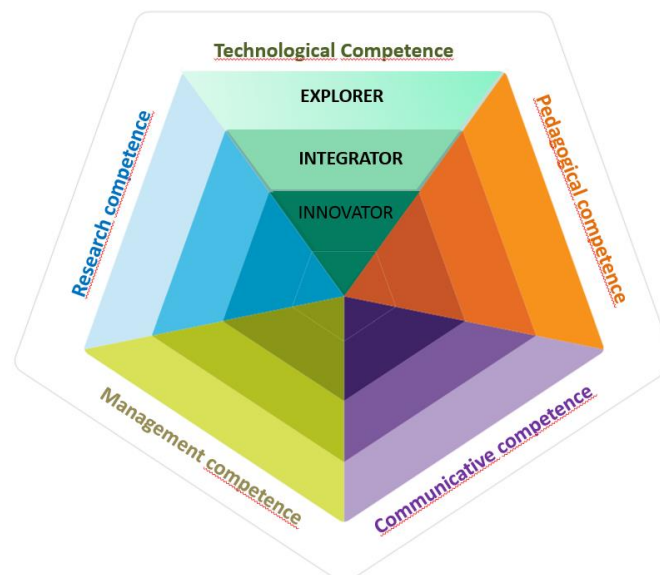


Figure 5: ICT Competencies’ Pentagon (MEN, 2013)

These competences are developed in different levels or moments of complexity: (1) *exploration* (allows the approach to a set of knowledge that is constituted in the possibility to access states of greater conceptual elaboration), (2) *integration* of knowledge already appropriate for solving problems in different contexts), and (3) *innovation* (emphasis is placed on the exercises of creation, which allows to go beyond the knowledge learned and to imagine new possibilities of action or explanation).

Pedagogical Competence is the ability to use ICT to strengthen teaching and learning processes, recognizing the scope and limitations of incorporating these technologies into the integral training of students and their own professional development. Descriptors of ICT Pedagogical Competence are presented [Table 2].

Table 2: Descriptors of ICT Pedagogical Competence Moments (MEN, 2013)

<i>Explorer</i>	<i>Integrator</i>	<i>Innovator</i>
I use ICT to learn by personal initiative and to update the knowledge and practices of my discipline.	I encourage in my students the autonomous learning and the collaborative learning supported by ICT.	Design ICT-mediated learning environments in accordance with the cognitive, physical, psychological, and social development of my students to promote the development of their competences.
I identify educational problems in my teaching practice and the opportunities, implications and risks of using ICT to attend them.	I use ICT with my students to meet their needs and interests and propose solutions to learning problems.	I propose ICT-mediated educational projects that allow reflection on one's own learning and knowledge production.
I know a variety of strategies and methodologies supported by ICT, to plan and follow up on my teaching work.	Implementing didactic strategies mediated by ICT, to strengthen in my students learning to solve real-life problems.	I evaluate the results obtained with the implementation of strategies that make use of ICT and promote a culture of monitoring, feedback and permanent improvement.

Each competence can be developed independently, which implies that a teacher can be in different moments of development in each one of these competences and the pentagon allows to identify his profile and offers guidelines for designing and implementing professional development programs for teachers. The guidelines are designed to recognize the individual or collective needs, formulate interventions aligned with the principles presented and follow the professional development processes to achieve the objectives.

3. TECHNO-PEDAGOGICAL MODELS

Teachers have at their disposal some techno-pedagogical models for the curricular integration of technology in the classroom, like for example: TPACK (Mishra & Koehler, 2006) or SAMR (Puentedura, 2014).

3.1. TPCK Model

The TPCK model focuses on the importance of knowledge (K) in Content (C), Pedagogy (P) and Technology (T) and the possible relationships between them [Figure 6].

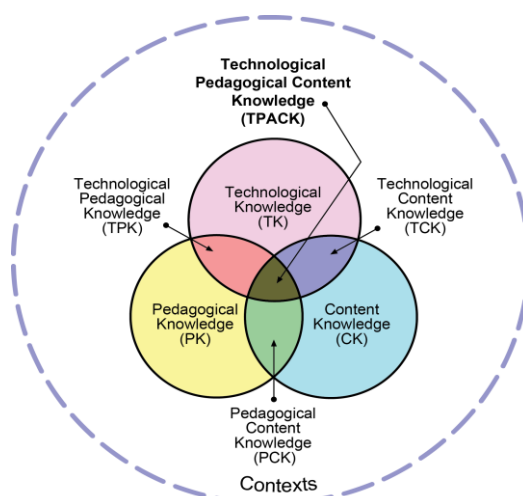


Figure 6: TPACK Model (Mishra & Koehler, 2006)

This model allows us to incorporate resources among different types of knowledge involved in the design of digital educational resources: content, pedagogy and technology. Some exemplifications are presented integrating the model during the design process of resources.

- Tools to improve the presentation of content, such as graphic editors, publishers and multimedia (TK-technological knowledge).
- Tools to facilitate reflection on learning can be blogs or social forums (PK-pedagogical knowledge).
- Resources for further knowledge of the subject area can be online databases and online encyclopedias (e.g., Wikipedia, WikiEducator) (CK-content knowledge).

Each situation requires from teachers a combination of these factors, there is no single solution or standard practice for all teachers. Each type of knowledge included in the TPACK model and their interrelationships is described by Mishra and Koehler (2006), and Koehler and Mishra (2009) (Table 3).

Table 3: TPACK model types of knowledge (Based on Mishra & Koehler 2006, and Koehler & Mishra, 2009)

Type of Knowledge	Description
CK-Content knowledge	Teacher knowledge on curriculum content (concepts, theories, ideas, organizational frameworks, etc.) at different stages or modalities. Teachers must master and understand the depth of foundations of knowledge of the disciplines to teach their subjects.
PK- Pedagogical knowledge	Teacher knowledge about the variety of teaching and learning methods, teaching strategies, dynamics, practices or activities that allow interaction and collaboration by students. In this kind of knowledge is taken into account the styles of teaching and learning, classroom management, planning of teaching units, student assessment, etc. Includes objectives, development of key competencies and application of methodological strategies. The teacher tries to understand how students learn, leading classroom management skills, planning and student assessment.
TK-Technology knowledge	Teacher knowledge about traditional and ICT-based technologies that can be integrated into the curriculum, and the importance of its permanent update for an educational use. It implies a fluidity and management of technologies that go beyond computer literacy. Teachers are required to have a mastery of technology to apply it productively for information processing, communication and problem solving.
PCK-Pedagogical Content Knowledge	Teacher knowledge about pedagogy applied to the teaching content of a specific knowledge area. Professor finds many ways to represent the contents and adapting educational materials based on prior knowledge, interests, and abilities of students.
TCK-Technological Content Knowledge	Teacher knowledge to understand which technologies are best suited for a learning content. At the same time, the type of content requires technological changes to curriculum integration.
TPK-Technological Pedagogical Knowledge	Teacher knowledge to understand how the teaching-learning process can change when a technology resource with a teaching strategy is used.
TPACK-Technological Pedagogical Content Knowledge	Teacher knowledge to implement teaching strategies appropriate to the specific context. It refers to effective teaching and learning through technology to facilitate learning based on the characteristics of students and context.

The different types of knowledge of the TPACK model (TK, CK, PK, TCK, PCK, TPK, TPACK) can be to be applied to specific educational purposes and contexts. This model has been applied to know the level of competence on ICT by teachers and to propose a pathway to their professional training process.

The challenge lies in the ability to integrate knowledge of the three elements -technology, pedagogy and content knowledge - depending on the variables in each educational setting.

3.2. SAMR (Puentedura, 2014)

The SAMR Model by Puentedura (2014) offers different levels of the role of technology, from *enhancement* (substitution and augmentation) to *transformation* (modification and redefinition) [Figure 7].

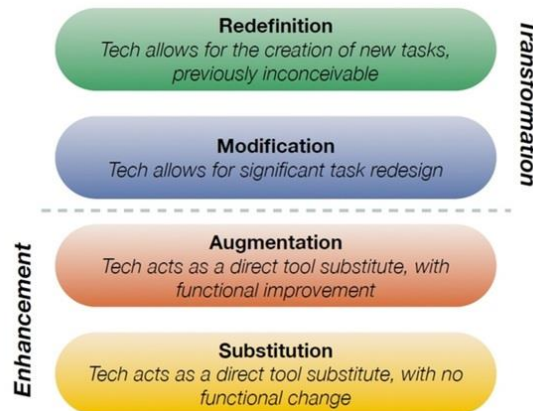


Figure 7: SAMR Model (Puentedura, 2014)

Following Puentedura (2014) the use of technology in education goes through different levels in an increasing order: substitution, increase, modification and redefinition. These levels can be characterized in terms of the role of technology as follow:

- *Substitution*. The technology acts as a substitute, a direct tool with no functional change.
- *Augmentation*. The technology acts as a direct replacement with a functional improvement.
- *Modification*. The technology allows an important task redesign.
- *Redefinition*. The technology allows the creation of new tasks, previously inconceivable.

SAMR Model offers an itinerary of continuous ICT training of teachers from basic to advanced levels: (1) ICT <without> functional change; (2) ICT <with> functional change; (3) ICT <with> redesigned activities; and (4) ICT <with> new activities.

The SAMR proposal contributes to understand the *Technology* concept, defined by his author as the beliefs about how technology can and should be used in teaching practices. This model has inspired other researchers as Roberts (2013) who propose for novel teachers to focus more on the role of teachers and students than in tasks. To do this, it proposes the following steps: *traditional* (traditional pedagogy with technology support), *enhanced* (integration of multiple tools to create an enhanced learning experience), *choice* (selected tasks using a specified range of tools) and *handoff* (flexible choice of tools to achieve an authentic product from the students' interests. In this same line are expressed McKnight, O'Malley, Ruzic, Horsley, Franey & Bassett (2016) identifying different roles that technology plays in enhancing teaching and learning: Access, Communication and Feedback, Teacher Time, Student Work.

4. RESOURCES IN A B-LEARNING DISTANCE EDUCATION CONTEXT: UNED CASE STUDY

Teachers should integrate traditional and ICT resources to take advantage of institutional media and services and at the same time to take advantage of the favorable environment in which students are digital natives. We describe the resources used in a b-Learning distance education context.

Teachers who develop their subjects in distance learning contexts can create conceptual epistemological frameworks for her subject, in which the students can learn within a complementary set of educational resources. The UNED methodology is based on b-Learning modality, combining face-to-face tutorship in training centers, traditional media (print, audiovisual, etc.), web tools (LMS, webconference, etc.) and in-person exams [Figure 8].

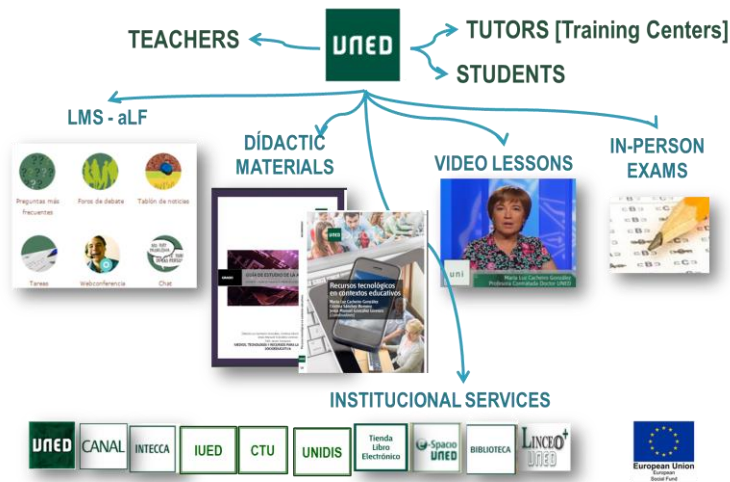


Figure 8: Resources in a b-Learning Distance Education Context (Own elaboration)

The b-Learning system at the UNED use an own LMS platform (aLF) in which occurs the different types of interaction among students, teachers and tutors. Institutional resources are available to complement the platform: documents repository (eSpacio), video lessons (Canal UNED), ebooks (ebrary, linceo+), etc. In addition to the digital components, students have traditional media at their disposal as the study guide and the basic text book. We present the results of several studies carried out with undergraduate and graduate students of the School of Education at the UNED.

Posgraduates students who answer to a questionnaire on the use of the training platform (n=115) say they use *quite* and *a lot* (62.6%) classic materials (books, articles, ...) in addition to the training platform. Appropriate use of the training platform “*opens a new world of opportunities both classroom training, and distance. It also contributes to the new teaching models to promote active student participation in their training*”. [Student_27]. A disadvantage in the use of the platform is “*Too much informative noise in the forum messages*”. [Student_43].

Graduate students of Education School at UNED who answer to a questionnaire on the ICT Competence as users and creators (n=49) believe that have a *high* and *advanced* ICT competence as user (48,3%), however they consider that have a *low* and *medium* as creator (75,9%). Among the advantages provided as a user of technological resources in the training process are: “*the speed with which I can obtain information on any subject, the ease of developing training and the possibility of conducting training courses (formal education / non-formal education) Through an online platform*” [Student_14]. The main advantage as a creator is “*that when you create a tool you adapt it to the use you want to give it*” [Student_13]. Among the difficulties identified as users and as creators highlights that “*not all sources are reliables*” [Student_14 & Student_5].

CONCLUSIONS

Teachers need to acquire skills that allow integration of web resources for information, collaboration and learning purposes. For Bates (2015), many media are better than one, because “this allows learners with different preferences for learning to be accommodated and to allow subject matter to be taught in different ways through different media” (p. 206). In this line of recommendations, Adams et al (2017) consider that «Educators are increasingly expected to employ a variety of technology based tools, such as digital learning resources and courseware, and engage in online discussions and collaborative authoring” (p. 23).

Teachers have standards in ICT skills developed by institutions at an international level to deal with the planning of teaching sequences, which can be enriched with the institutional repositories of resources developed by both designers and teachers, and Taxonomies of criteria to evaluate the technological and pedagogical quality of web resources. The innovation in teaching needs in-depth knowledge of media design to make the appropriate and creative decisions to select and apply ICT resources and virtual scenarios to solve the most important challenges in the training process (Medina & Domínguez, 2015).

The International Telecommunication Union (ITU-UNESCO, 2014) analysis presents different stages to introduce ICT in education depending on the penetration level in education: *e-readiness* (trained teachers through basic ICT infrastructure), *e-intensity* (ICT-enhanced content development and innovative pedagogy management through distance education resources), and *e-impact* (ICT for lifelong learning through podcasting, videoconferencing, etc. resources). This ICT integration requires following Hibbitts & Travin (2015) a combination of a stablish sequence of steps from Learning and Technology point of view: Assess learners needs, Define and Conceptualize, Assess technology fit, Design, Evaluate, Implement and Deliver.

Digital Teacher Competence requires: (1) to know the available resource repositories to respond the specific educational needs, (2) to apply technological and pedagogical models that provide a framework for the integration of ICT in educational contexts, (3) to evaluate the adequacy of didactic strategies with ICT through exemplifications.

REFERENCES

- Adams, S., Cummins, M., Davis, A., Freeman, A., Hall, C., & Ananthanarayanan, V. (2017). *NMC Horizon Report: 2017 Higher Education Edition*. Austin, Texas: The New Media Consortium
- Ala-Mutka, K. (2011). *Mapping Digital Competence: Towards a Conceptual Understanding*. Luxembourg: JCR, European Union.
- Bates, T. (2015). Teaching in a Digital Age: Guidelines for designing teaching and learning. Retrieved from <https://opentextbc.ca/teachinginadigitalage/chapter/models-for-choosing-media-and-technologies/>
- Cacheiro, M.L. (2011). Recursos educativos TIC de información, colaboración y aprendizaje. *Pixel-Bit, Revista de Medios y Comunicación*, 39, 69-81. Retrieved from <http://acdc.sav.us.es/pixelbit/images/stories/p39/06.pdf>
- Campos, J., & Solano, W. (2017). The future of the teaching profession from the perspective of students with a Major in Education. *New Approaches in Education Research*, 6(2), 87-92. doi: 10.7821/naer.2017.7.191
- Churches, A. (2009). Taxonomía de Bloom para la Era Digital [*Bloom's Taxonomy for the Digital Age*]. Retrieved from <http://eduteka.icesi.edu.co/articulos/TaxonomiaBloomDigital>
- Cobo, J.C. (2009). *Strategies to Promote the Development of E-competencies in the Next Generation of Professionals: European and International Trends*. UK: ESRC. Retrieved from <http://www.cardiff.ac.uk/socsi/research/researchcentres/skope/publications/monographs/monograph13.pdf>
- Ferrari, A. (2013). DigComp: A Framework for Developing and Understanding Digital Competence in Europe. Luxembourg: JCR-European Union. Retrieved from <http://publications.jrc.ec.europa.eu/repository/bitstream/JRC83167/lb-na-26035-enn.pdf>
- Hibbitts, P. & Travin, M. (2015, January 19). A Model for Learner Needs, Experience Design & Technology Development. Retrieved from <https://www.linkedin.com/pulse/model-learner-needs-experience-design-technology-paul-hibbitts?trk=mp-reader-card>
- ITU-UNESCO (2014). Partnership on measuring ICT for development final WSIS targets review achievements, challenges and the way forward. Retrieved from http://www.itu.int/en/ITU-D/Statistics/Documents/publications/wsisreview2014/WSIS2014_review.pdf
- Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, 9, 60-70.
- McKnight, K., O'Malley, k., Ruzic, R., Horsley, M.K., Frane, J.J. & Bassett, K. (2016). Teaching in a Digital Age: How Educators Use Technology to Improve Student Learning. *Journal of Research on Technology in Education*, 48(3), 194-211. doi: 10.1080/15391523.2016.1175856
- Medina, A. & Domínguez, M. C. (2015). Modelo didáctico-tecnológico para la innovación educativa [*Didactic-technological model for educational innovation*]. In M.L. Cacheiro, C. Sánchez & J.M. González, *Recursos tecnológicos en contextos educativos [Technology resources in educational contexts]*. Madrid: UNED.
- MEN (2013). Competencias TIC para el Desarrollo Profesional Docente [*ICT Skills for Professional Teacher Development*]. Colombia: Ministerio de Educación Nacional. Retrieved from http://www.colombiaaprende.edu.co/html/micrositios/1752/articles-318264_recurso_tic.pdf
- Mishra, P. & Koehler, M.J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108, 1017–1054. Retrieved from

- http://punya.educ.msu.edu/publications/journal_articles/mishra-koehler-tcr2006.pdf
- Puentedura, R.R. (2014). Learning, Technology, and the SAMR Model: Goals, Processes, and Practice. Retrieved from <http://www.hippasus.com/rrpweblog/archives/2014/06/29/LearningTechnologySAMRModel.pdf>
- Roberts, J. (2013, November 30th). Turning SAMR into TECH: What models are good for [blog]. Retrieved from <http://www.litandtech.com/2013/11/turning-samr-into-tech-what-models-are.html>
- UNESCO (2008). ICT Competency Standards for Teachers. Retrieved from <http://www.unesco.org/en/competency-standards-teachers>
- UNESCO (2011). ICT Competency Framework Standards for Teachers. Retrieved from <http://unesdoc.unesco.org/images/0021/002134/213475e.pdf>.
- Valencia, T.; Serna, A.; Ochoa, S.; Caicedo, A.M.; Montes, J.A. & Chávez, J.D. (2016). Competencias y estándares TIC desde la dimensión pedagógica. Una perspectiva desde niveles de apropiación de las TIC en la práctica educativa docente [*Competences and ICT standards from the pedagogical dimension. A perspective from the levels of appropriation of the TIC in the teaching educational practice*]. Colombia: Pontificia Universidad Javeriana – Cali y UNESCO. Retrieved from <http://www.unesco.org/new/fileadmin/MULTIMEDIA/FIELD/Santiago/pdf/Competencias-estandares-TIC.pdf>
- Vuorikari, R., Punie, Y., Carretero, S., Van den Brande, G. (2016). DigComp 2.0: The Digital Competence Framework for Citizens. Update Phase 1: The Conceptual Reference Model. Luxembourg: Office of the European Union. doi:10.2791/11517

Websites

- CoI. Community of Inquiry [website] <https://coi.athabasca.ca/coi-model/>
- Digital Competences for Teachers Moodle Coursework [coursework] <http://moodle.digital-competences-for-teachers.eu/>
- SAMR. Substitution, Augmentation, Modification & Redefinition Model [blog] <http://www.hippasus.com/rrpweblog/>
- TPACK. Technological Pedagogical and Content Knowledge Model [website] <http://www.tpack.org/>
- UNED. Universidad Nacional de Educación a Distancia [*Spanish National University of Distance Education*] [website] <http://www.uned.es/>

Acknowledgments

This study has been developed in the framework of (1) the Transdisciplinary and International Innovation Group for the Development of Students and Teachers Competences in Higher Education (ComDisDoc) (UNED, Spain, 2017) and (2) the Research Project about Development of competences and their impact on teacher education: Harmonization of educational processes between secondary and university education (ComProfeSU) (Spanish Ministry of Economy and Competitiveness, 2017-2019).

Educational Robotics: Forming Scientific Communities in the Classroom

Julio ENCALADA CUENCA

Universidad Técnica de Machala
jencalada@utmachala.edu.ec

Sara CRUZ NARANJO

Universidad Técnica de Machala
scruez@utmachala.edu.ec

Marcos ARBOLEDA BARREZUETA

Universidad Técnica de Machala
marboleda@utmachala.edu.ec

Rosemary SAMANIEGO OCAMPO

Universidad Técnica de Machala
rsamaniego@utmachala.edu.ec

Birmania JIMÉNEZ VILLAMAR

Universidad Técnica de Machala
bjimenez@utmachala.edu.ec

ABSTRACT

The fact of involving the scientific method in educational institutions of secondary level has a significant weight in the scientific vocation of the high school graduate. Therefore, the current study analyzes as a didactic proposal, the use of the scientific method (to observe and to formulate a question, to investigate theoretically, to construct a hypothesis, to experiment, to collect data, to observe, to conclude, and communicate results), during the teaching of programming in Technician Computing Baccalaureate. The study was carried out in two high schools, in which programming teaching performed with Lego EV3 robots is being taught. A pre-post-test design was carried out with experimental groups (n = 25, with scientific method) and control (n = 26, without scientific method) to find out whether or not the scientific method improves programming learning. The results show a slight-significant difference in learning outcomes of systems programming in the experimental group, compared to the control group.

Keywords: educational robotics, scientific method, programming

INTRODUCTION

In the current global economy, knowledge as human capital has especially relevance. Knowledge societies are consolidated in function of the scientific research that are produced in university centers; In this sense, some studies show the benefits of initiating the scientist's training before entering to superior education (Cheung, Slavin, Kim, & Lake, 2017). Once high school students, understand the scientific method, begin to make choices on their scientific vocation, and are encouraged to continue on this path, when their university career has been selected.

In recent years, Ecuadorian professionals, have demonstrated interest in scientific production, due to the low level evidenced in the university environment. One of the less productive areas in this sense has been computer science, although there is a technical baccalaureate and university degrees in the area. It is necessary to look for alternatives that favor the process of training the scientist in computational disciplines. The search should start with an emphasis on the approaches made in the previous paragraph. The integral formation of the scientist begins before to access the university. So, within the area of computational sciences, what educational strategy can be used to initiate the formation of scientific communities in high schools in Ecuador?

Initiative that stands out as educational innovation in the area of computational sciences

The world community has begun to focus greatly on educational robotics in computer science learning (Slavkovic & Savic, 2016). Robots of different types have been widely used as educational resources at the primary, secondary and higher levels (Merkouris & Chorianopoulos, 2015; Umbleja, 2016; Rodriguez Perez, Gold-Veerkamp, Abke, & Borgeest, 2015; Grandi, Falconi, & Melchiorri); mainly, in teaching-learning processes of programming languages. The motivation for learning programming language, is one of the most worked aspects in classrooms with educational robotics (Curto & Moreno, 2013; Wong & Hsieh, 2016); consequently, favorable learning outcomes are obtained in programming systems. Educational robotics has consolidated in the scientific community of the area of Computer science as object of study by the benefits that its didactic use offers. Educational robotics is an environment of learning in which robots are used to favor the understanding of the subjects of study. But, it is convenient to establish the difference between Teaching Robotics (TR) and Teaching With Robots (TWR). These two ways of working with robots in the classroom are represented in figure 1.

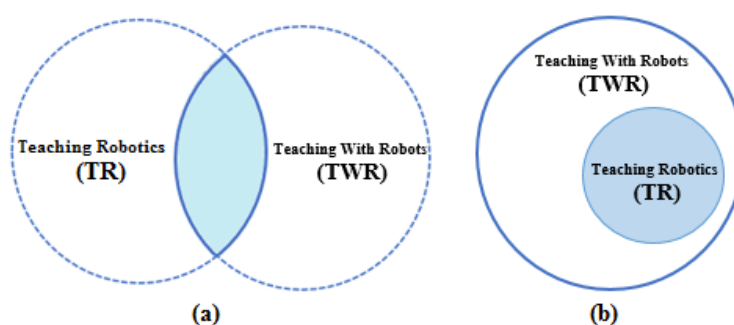


Figure 1.- TR and TWR: Two Representations of Teaching with Robots (Source: Catlin, 2012).

In the context of this research, robotics was used as shown in Figure 1 (a). Since the main object was not to learn to build robots, but to work with educational robotics to learn to program computer systems. According to this, the Lego Mindstorms kit was used, specifically the EV3 model. The choice of this kit was done due to the review of scientific literature in which it was observed that in various parts of the world, the LEGO Mindstorms educational robotic kit is widely used in primary and secondary education (Kee, 2011), and in superior education (Danahy et al., 2014). This is due to their learning curve, this system hides the complexity of electronic circuits and the student focuses mainly on robot assembly and programming learning. Then, educational robotics kits seem to have found a place in the classroom for system programming and algorithm resolution. Which is favorable, since programming is a key element in the area of computational and related sciences.

Scientific production in the area of computational sciences, in Latin America

Despite the educational innovations spread in the field of computer science both in secondary and higher education. These have not promoted the scientific production in the area. Among the evidences found, the descriptive statistics shows that in Latin America does not exist sufficient evidence on the scientific articles published on computational sciences in high impact journals (see Figure 2). Ecuador with just 530 articles, is a clear sign of the poor scientific production in this area, whereas Brazil, the country which produced the most articles that is 49,296 of published articles. Ecuadorian production is really low, which might occur due to the fact that from the technical baccalaureate until the university careers; the disciplines related to the computational sciences are visualized just like technical careers, however, all the engineering process managed in the educational praxis of this area, is appropriate for the scientific production.

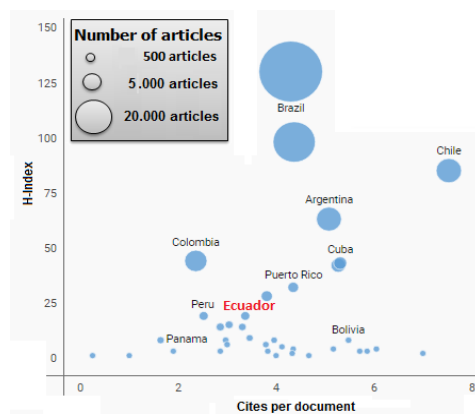


Figure 2.- production of scientific articles in computing sciences area in Latin America 2015-2016 (SCImago, 2016)

Conformation of scientific communities in technical baccalaureate.

Based on this background, it is considered that one of the elementary subjects in the area of computer science is computer programming, in addition, Ecuadorian high schools have begun to incorporate educational robotics within their learning environments, due to the good results in student academic performance. In the present study, educational robotics was combined with the cycle of the scientific method to see the effect they cause as an educational resource in the learning achievements of a specific field of Informatics. So, the research question which guided the study was raised: What effect does the combination of educational robotics with scientific method have on programming learning?

Objectives of the study:

To combine educational robotics (Lego EV3) with the scientific method to use them as an educational resource in the teaching of computer programming.

To analyze the impact of the educational resource (Lego EV3 + scientific method) on the learning achievements in programming of computational systems.

Hypothesis of the study

According to the central research question and the objectives of this study, the following hypotheses were designed:

H1: There are significant statistical differences between students who use scientific methodology in their programming classes (Lego EV3, with scientific method) and students who do not use it (Lego EV3, without scientific method) with regards to programming knowledge of computing systems, Before starting the educational intervention.

H2: There are significant statistical differences between students who use scientific methodology in their programming classes (Lego EV3, with scientific method) and students who do not use it (Lego EV3, without scientific method) with regards to programming knowledge of computing systems; Once the educational intervention is completed.

RESEARCH METHODOLOGY

Design of the study and participants

The research was quantitative and a quasi-experimental design was used with control group (Creswell, 2009; Hernández, Fernández and Baptista, 2010). The groups (control and experimental) were made up of students from third high school class of two high schools. Both groups were using Lego EV3 in their schools educational robots during programming teaching. The experimental group was incorporated the scientific method to its programming teaching process, for the purpose of the present study. The experimental group had 25 students and the control group had 26 students. In the total sample, 30 men and 21 women were counted, with an average age of 18 years old. In addition, to initiate the study, ethical norms of researching with human beings were taken into account by which written consent was obtained.

Procedure

Within the framework of the involvement project with the community that the Technical University of Machala had. The researchers of the present study, carried out the research in two schools of the Province of El Oro. In this sense, before the investigation process, in both schools (Control and experimental) an induction was carried out in which teachers and students were involved. Only the experimental group was trained during induction on scientific method. Students and teachers were then asked to sign a consent and collaboration form, all participants voluntarily expressed their agreement.

The study took place during the academic year 2016, from May to September. With the collaboration of the teachers of the subject, before starting classes in the month of April, standard micro-curricular planning was designed for both groups of students, in this way both control and experimental group received equivalent training. The unique difference was that the experimental group in its planning had the scientific method incorporated.

In order to set up the micro-curricular planning of the experimental group (Lego EV3 + scientific method), the researchers along with the teacher of the subject, searched correspondence between each phase of the scientific method of the design, construction and programming of the Lego EV3 robot (see figure 2).

Framework of educational robotics with scientific method.

The experimental group's lesson plan design was produced accordingly based on guidelines, which should be followed by students; this ensured the correspondence of the scientific method with educational robotics, the details of these guidelines are listed below:

Observation & ask question: for the observation stage and question formulation of the research, students were asked to think of: what kind of robot they wanted to design? And what challenges would the robot have to face? For this, students were invited to see some videos of LEGO EV3 robots already built and in operation.

Background research: In this phase, students were asked to review the LEGO EV3 robot, manuals for the requirements to assemble the robot they had in mind, and were also told about some selected links of the Internet for their search. This theoretical review would guarantee that the robot can be assemble.

Hypothesis: according to the selected robot for assembling, students were requested to set challenges, for the robot to try to achieve them. These challenges constitute the research hypothesis.

Experiment: at this stage the student performed all the tests to see if the robot managed to carry out the challenge.

Collecting data: data from the tests carried to the LEGO EV3 robot were collected for further analysis.

Analyze data: Students with the support of both researchers and teacher, placed their data in the SPSS statistical software for further analysis.

Conclusions: according to the data analysis performed in SPSS, the student with the support of both, the researchers and the teacher of the subject; made conclusions about the tests performed with the robot and the challenge proposed.

Report of results: finally, the stages of the design, construction and programming of the robot were placed in a scientific poster with the support of the teacher of the subject.

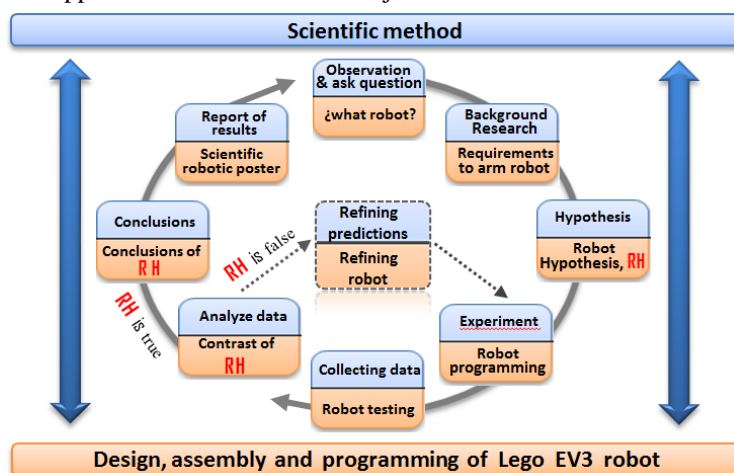


Figure 2.- Scientific method corresponding and construction of robot Lego EV3

During the months that the study lasted, programming classes were done by setting up Lego EV3 robots and programming them. For the month of September / 2016, the study ended, the data of official student scores in the subject, in both groups, were collected for analysis. Also, as part of the completion of the research project, the high school considered as an experimental group held a science and technology fair with the robots and scientific posters which were developed during the study.

Data Analysis

After obtaining the data of the students' scores of both groups (control and experimental), first Shapiro-Wilk test (due to sample size) was used in order to determine the normality of samples from the experimental and control groups. Then, to check for significant differences between groups in both pre-test and post-test, Mann-Whitney U-test was used. Finally, after the comparison between groups, the non-parametric statistical method was used to analyze the size of the effect for two independent groups (Grissom & Kim, 2012); In addition, to categorize the resulting sizes of the effect, it was stated what Cohen mentioned (1992; cited in Rienties et al., 2013): 2, which is considered as a small effect; 5, medium effect; 8, big effect. .

RESULTS

Tests of normality in the experimental group generated the value $p = 0.008$, with which it was determined that the sample was not normally distributed. In the control group; the value $p = 0.004$ determined that the sample was neither normally distributed.

Contrasting hypotheses 1: in table 1, regarding to the pre-test, no statistically significant differences were observed between control and experimental group ($U = 306.00$; $Z = -0.36$; $p = 0.72$). This indicated that in both groups, students before starting treatment, had the same skills in system programming. In addition, the size of the effect for the difference between the groups was, relatively small. Consequently, h_1 was rejected.

Table 1. Comparison of the scores gotten before the treatment, by using Mann-Whitney's U test

Group	N	Mean rank	Sum of rank	Mann-Whitney U	Z	p	Effect size
Experimental	25	25,24	631,00	306,00	-0,36	0,72	0,47
Control	26	26,73	695,00				

Contrasting hypotheses 2: in table 2, regarding to post-test statistically significant differences were observed between the control and experimental groups ($U = 146.50$, $Z = -3.38$, $p = 0.00$), in which difference the Experimental group had an average range higher than the control group. In addition, the effect size for the difference between groups was relatively moderate. Therefore, h_2 was accepted.

Table 2. Comparison of the scores gotten after the treatment, by using Mann-Whitney's U test

Group	N	Mean rank	Sum of rank	Mann-Whitney U	Z	p	Effect size
Experimental	25	33,14	828,50	146,50	-3,38	0,00	0,23
Control	26	19,13	497,50				

CONCLUSIONS

First of all, the scientific method combined with educational robotic learning environments, favors the learning achievements in programming in the area of Informatics. In addition, the design, assembly and programming of robots benefit from the structure of the scientific method, since each phase of the robot's construction; a phase of the scientific method can be selected. This is the key of the lesson plans design for teaching-learning of computer programming in baccalaureate.

These findings suggest that scientific method combined with educational robotics are an approximation to the conformation of scientific communities in the area of computational sciences in secondary schools. Students participate in studies framed in the structure of the scientific method and expose their results through a scientific poster at fairs. In order to start some training with students as a scientist in the schools, which help setting new challenges in the scientific production of the area of Computer Science in Universities.

The quasi-experimental character of this study is a contribution to the educational reality of Ecuador, and it is supposed to be a key piece to go forth within the scientific objectives of higher education. In addition, the proposal reflects the need to raise and develop more initiatives of this type in the secondary field, due to the positive collaboration of teachers and students.

The linking projects of the universities with the community open a range of possibilities to propose alternatives that favor the formation of scientific communities at the secondary level, especially in high school baccalaureate, where students are about to choosing their university majoring. The initial formation of the scientist as an approximation is liable to the efforts that are made in the last years of high-school.

FUTURE WORK

The present research is a pilot project that is part of a larger and more comprehensive program that searches for connect high school students with scientific method. In this context, a longitudinal study will be carried out with the framework of figure 2 to analyze the Secondary school students' perceptions about scientific method.

ACKNOWLEDGMENTS

This research was approved and financed by the Technical University of Machala, through resolution #122/2016 of the University Council.

REFERENCES

- Cheung, A., Slavin, R., Kim, E., & Lake, C. (2017). Effective secondary science programs: A best-evidence synthesis. *Journal of Research in Science Teaching*, 54(1), 58-81.
- Cresswell, J. (2009). *Research Design. Qualitative, Quantitative, and Mixed-methods Approaches*. Thousand, Oaks, CA: Sage.
- Curto, B. and Moreno, V., 2016. Robotics in Education. *Journal of Intelligent and Robotic Systems* 81, 1, 3-4. DOI= <http://dx.doi.org/10.1007/s10846-015-0314-z>.
- Danahy, E., Wang, E., Brockman, J., & Carberry, A. (2014). Lego-based robotics in higher education: 15 years of student creativity. *International Journal of Advanced Robotic Systems*, 11(2), 1–15.
- Durães, D. (2015). Gaming and Robotics to Transforming Learning. In T. Mascio, R. Gennari, P. Vittorini, & F. De la Prieta (Eds.), *Methodologies and Intelligent Systems for Technology Enhanced Learning. Advances in Intelligent Systems and Computing* (Vol. 374.). Cham: Springer.
- Grandi, R., Falconi, R., & Melchiorri, C. (2014). Robotic Competitions: Teaching Robotics and Real-Time Programming with LEGO Mindstorms. *Proc. IFAC World Conference, IFAC, 2014*, (pp. 10598 - 10603).
- Grissom, R., & Kim, J. (2012). *Effect sizes for research: Univariate and multivariate applications* (2nd ed.). New York, NY: Taylor & Francis.
- Hernández, R., Fernández, C., & Baptista, M. (2010). *Metodología de la Investigación* (5ª ed.). México: McGraw Hill Educación.
- Kee, D. (2011). Educational Robotics-Primary and Secondary Education. *IEEE Robotics & Automation Magazine*, 18(4), 16–19.
- Merkouris, A., & Chorianopoulos, K. (2015). Introducing Computer Programming to Children through Robotic and Wearable Devices. *WiPSCE'15: Proceedings of the Workshop in Primary and Secondary Computing Education* (pp. 69-72.). London, UK,: ACM.
- Rienties, B., Brouwer, N., & Lygo-Baker, S. (2013). The effects of online professional development on teachers' beliefs and intentions towards learning facilitation and technology. *Teaching and Teacher Education*, 29, 122- 131.

- Rodriguez Perez, S., Gold-Veerkamp, C., Abke, J., & Borgeest, K. (2015). A new didactic method for programming in C for freshmen students using LEGO Mindstorms EV3. IEEE 2015 International Conference on Interactive Collaborative Learning (ICL), (pp. 911-914).
- SCImago. (2016). SJR- SCImago Journal & Country Rank. Retrieved junio 22, 2016, from <http://www.scimagojr.com/>
- Slavkovic, N., & Savic, A. (2016). Robotic Teaching Opportunities in The Higher Education. Turkish Online Journal of Educational Technology 2016 (December Special Issue), 431-438.
- Umbleja, K. (2016). Can K-12 Students Learn How to Program with just Two Hours? In Learning Technology for Education in Cloud – The Changing Face of Education (pp. 250-264).
- Wong, R. H., & Hsieh, S. (2016, June), MAKER: An Entry-Level Robotic System Design Project for Undergraduates and K12 Paper presented at 2016 ASEE Annual Conference & Exposition, New Orleans, Louisiana. 10.18260/p.25603

Effective Affective Communication in Online Learning Environments: Social Presence

Professor David Mykota

*Department of Educational Psychology and Special Education,
College of Education, University of Saskatchewan,
Saskatoon, Sk. S7N 0X1
david.mykota@usask.ca*

Deighan Remoundos Doctoral Candidate

*Department of Curriculum Studies Educational Design & Technology,
College of Education, University of Saskatchewan,
Saskatoon, Sk. S7N 0X1
deighan.remoundos@usask.ca*

ABSTRACT

The purpose of this paper is to report the findings of a scoping review of the construct social presence as applied to the practices and guidelines for building, initiating, and maintaining social presence in an online learning environment. The methodology developed follows the design for scoping reviews as advocated by Arksey and O'Malley. A scoping study is desirable because by synthesizing the research literature on social presence the opportunity to identifying practical guidelines for the development of social presence is facilitated. Results from the manuscripts screened for inclusion and synthesized from the data extracted in the scoping review, provide strategies for the structuring of social presence in online environs. Within this context, instructors need be conscious of those recommendations offered as guidance to best practices in the building, initiating and maintaining social presence in an online learning environment.

INTRODUCTION

People are social creatures and increasingly the Internet is used in a variety ways to bring people together. In education, the Internet has facilitated the development of online learning, which has grown in popularity in post-secondary institutions because of its ability to provide a flexible and accessible learning environment for students. How people interact socially in an online learning environment is described as social presence. As education is a social event it is important to understand the relationship between social presence and online learning. This is because social presence is considered the critical affective (i.e. social and interpersonal) component to communication in an online learning environment. It is one of the more important concepts used to determine the level of interaction (Cui, Lockee, & Meng, 2013; Danchak, Walther, & Swan, 2001) and cognitive engagement (Garrison, Anderson, & Archer, 2000; Garrison, Cleveland-Innes, & Fung, 2010) in an online learning environment. And has been found to impact grade attainment; student retention (Bowers & Kumar, 2015; Robb & Sutton, 2014); and student satisfaction (Gunawardena & Zittle, 1997; Moallem, 2015; So & Brush, 2008).

Social presence was originally defined by social psychologists in reference to face-to-face communication. The theoretical underpinnings of the construct were thought to comprise two dimensions. They were immediacy (Weiner & Mehrabian, 1968) and intimacy (Argyle & Dean, 1965). Intimacy is the degree of closeness one experiences and feels in an interpersonal relationship through verbal and non-verbal behaviors (Argyle & Dean, 1965). Immediacy behaviors are related to the psychological distance between individuals (Weiner & Mehrabian, 1968) and are thought to maintain immediacy type behaviors (Rettie, 2003). When applied to computer mediated communication (CMC) Short, Williams, and Christie (1976) defined social presence as the “degree of salience of the other person in the communication and the consequent salience of the interpersonal relationships” (p. 65).

Based on these early conceptualizations, Rafaeli (1988, 1990) advanced the notion of a third dimensional aspect to the construct, interactivity. Accordingly, interactivity can be viewed as enhancing the quality of the communicative context. It is subjective in nature as it influences the degree to which communication occurs between individuals and groups (Rafaeli, 1988, 1990). To help understand the relationship between these dimensions, Gunawardena (1995) in her study on social presence theory, concluded that immediacy behaviors enhance and maintain social presence and that those who moderate CMC need to promote a sense of online community so that interaction in collaborative learning environments can occur. In doing so, the degree to which an individual in an online learning environment is perceived as a real person is enhanced. As thinking changed on how we perceive interpersonal and social communication, a re-conceptualization of social presence theory from a strictly technologically determined event to one that is co-determined by social and interpersonal interactions as applied to online learning occurred (Gunawardena & Zittle, 1997; Tu & McIsaac, 2002).

Garrison et al. (2000) then went on to define the construct as the ability of participants in a community of inquiry to project themselves socially and emotionally as ‘real’ people through the medium of communication. Subsequently, Rourke, Anderson, Garrison and Archer (2001) using qualitative content analysis analyzed the transcripts derived from online courses to determine how social presence was represented. Rourke et al. (2001) found that affective indicators (i.e., values, beliefs, feelings, and emotions); cohesive indicators (i.e., group presence and commitment); and interactive indicators (i.e., attending in a socially meaningful way) were found to exist.

Incorporating social learning theory, Tu and McIsaac (2002) described social presence as the “degree of feeling, perception, and reaction of being connected via CMC to another intellectual entity”(p.140). Tu and McIsaac (2002) initially presented the construct in three dimensions stating there are a social context, a communication context, and an interactivity context. Using factor analysis, Tu (2005) developed and validated the computer-mediated communication questionnaire (CMCQ). In the initial validation study a five-factor solution comprised of the social form of communication, privacy, intimacy, social context, and interactivity factors were found to exist (Tu & Yen; 2006; Yen & Tu, 2008).

Garrison (2009) then further expanded on social presence within the Community of Inquiry (CoI) model describing it as “the ability of participants to identify with the community, communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities” (p.352). Social presence in this model refers to the extent people can present themselves emotionally and socially in an online environment as a real person. However, Garrison’s (2009) model has come under increased scrutiny leading to a recasting of social presence within the CoI model into a two dimensional construct (Kreijns, Van Acker, Vermeulen, & Van Buuren, 2014). Within this context Kreijns et al. (2014) argue that only aspects of social space are articulated within the CoI model and not the psychological realness of individuals communicating within an online environment.

As demonstrated by the above-mentioned brief review, the definition of what constitutes social presence was conceived over forty years ago when communication on the computer through the Internet was relatively basic. As a result, social presence lacks clarity making it challenging to establish what is or is not working, socially and interpersonally, in an online learning environment. In turn, this has led researchers to conclude that definitions for the social presence construct exist along a continuum making it difficult to aggregate findings (Chen, Fang, & Lockee 2015; Kreijns et al., 2014; Lowenthal, 2010) and how best to structure, develop, and facilitate online learning environments that engage and retain learners (Kreijns, Kirschner, & Vermeulen 2013). To address this problem, the purpose of this study is to conduct a scoping review of the research literature to help determine in what way social presence has been developed and applied within the online learning environment. Using this rapid review of the literature, the main objective of the study is to identify some practical guidelines for instructors and course developers in how to create and use social presence to strengthen student’s learning in quality online learning environments.

METHODOLOGY

The scoping review integrated the original scoping study design of Arksey and O'Malley (2005), with enhancements by Levac, Colquhoun, and O'Brien (2010). The decision to use a scoping study was based on the literature available to review. Rather than a systematic review, which has well-defined research questions and very specific criteria focusing on randomized controlled trials while assessing for bias, scoping studies are considered more rapid reviews of the literature, ask broad questions, can have post hoc inclusion/exclusion criteria, do not assess for bias, and examine a wide range of evidence (Levac et al., 2010). The scoping review involved; identifying relevant studies; selecting studies; charting the data; collating and summarizing; and reporting results. Working in consultation with the research librarian a series of search terms was constructed representative of social presence allowing for the searching of the ERIC, PsychINFO, ProQuest, ProQuest Dissertation and Thesis, and JSTOR databases. A two stage screening process was employed whereby studies were initially selected through a title, abstract, and keyword screen. Of those studies identified for inclusion a full text read was conducted with a data extraction form completed. The data extraction form was modeled after Peters et al.'s (2015) recommendations for the conducting of systematic scoping reviews. The form was then piloted with modification occurring until there was an 80% agreement between reviewers as to its completeness and ease of use. The data was then entered into word and excel files with a numerical analysis of the selected studies descriptive characteristics and a content analysis (Hsieh & Shannon, 2005) pertinent to the objective outlined conducted. In total using the aforementioned protocol over one hundred studies were included for analysis.

RESULTS

The results reported are specific to one aspect of the scoping review; the practices and guidelines for building, initiating, and maintaining social presence in an online learning environment. Further content analysis related to the operationalization of the construct and the outcomes of the construct are ongoing but not reported in this study. Nevertheless, a brief overview of the data garnered from the numerical analysis will be reported so as to provide a demographic description of those studies extracted for analysis in the scoping review.

In this respect, the numerical analysis of the studies selected indicates that research on social presence is conducted worldwide. Although the vast majority (>50%) has been conducted in the United States there is a growing body of research into the construct occurring in Asia (14%), Europe (18%), Canada (12%), Australia/New Zealand (6%) and the Mid East (4%). The vast number of studies relate to asynchronous online learning; however recent trends in social presence research indicate that virtual learning networks, MOOCs, virtual 3D environments and multi-media online learning are gaining traction in the research literature. In terms of study design, sample sizes typically are small in nature with the exception of a few experimental designs. Nevertheless, there are increasingly more sophisticated multivariate designs being conducted that include instrument and scale development and study replication is also being occurring more frequently.

Although there are a number of mixed methods studies, the research design is less rigorous. In terms of qualitative research, more is occurring and some are using Rourke et al.'s (2001) methods regarding social presence indicators (i.e. affective, interactive, and cohesive indicators) for coding purposes. This is also found in quantitative studies and is being used as a basis to group and examine differences between variables. Finally, a large number of studies tend to use surveys and examine between group differences and/or correlations between variables

Findings from the content analysis reported, focus on strategies synthesized from the scoping review, which enhance student perceptions of social presence and the building, initiating, and maintaining social presence in the online learning environment. Building course content conducive to social presence in the design of the course (Aragon, 2003) is essential when conceptualizing a socially constructivist learning environment (Rovai, 2007). It was found instructors and course designers need be aware that more social presence is not always desired or necessary.

Sometimes a low level of social presence will suffice while more social presence could also result, in some situations unsatisfactory outcomes (Biocca, Harms, & Burgoon, 2003). Ostlund (2008) points out those courses with low degrees of structure result in highly individualistic learning experiences while courses with a high degree of structure are generally more cooperative. Thus, instructors interested in designing collaborative and socio-affective learning environments should carefully consider how they structure and balance several course components.

Social presence in online environments can be created through the development and use of a learning management system (LMS), controlled through class size and enhanced by properly training instructors for facilitating social presence (Cui et al., 2013; Plante & Asselin, 2014; So & Brush, 2008). Well-constructed course activities form the basis of building social presence and can enhance or limit social presence depending on how they are implemented. A balance of individual assignments, authentic problem based group tasks (Aragon, 2003; So & Brush, 2008), discussion groups, as well as enhanced media integration (Kim, Kwon, & Chow, 2011) and a clear plan for ongoing assessment and evaluation all contributed to building social presence throughout the course.

Additional qualities that serve online instructors well is the ability to be flexible and to manage diversity, ambiguity, and conflict (Billings & Halstead, 2009) while still having a positive regard for students and their comments (Rovai, 2007). Course instructors need be trained in online course delivery and be actively present throughout the course especially during introductory activities. In turn, a sense of connectedness and community among students and with the instructor can be created (Cui et al., 2013). Active participation by the instructor also models the skills required to interact in an online environment for novice students (Rovai, 2001). As discussed, specific attention needs to take place in the development of an online course to identify the amount of social presence desired and the resultant strategies and learning activities. A list of strategies by type and author for building social presence as extracted from the scoping review are presented in Appendix A.

After course design, initiating social presence becomes critical as it serves as a departure for building an online community of learners and marks the beginning of the transactional relationships in that community (Garrison et al., 2000). These initial activities allow facilitators and learners to begin to project themselves emotionally and socially as real people in the online learning environment (Gunawardena, 1995; Garrison et al., 2000) by acquiring the skills needed to succeed (Rovai, 2007). Many researchers have highlighted ways to introduce learners to the online environment. It should be noted that although initially interactions may be superficial, over time interactions can be coached toward greater complexity and depth.

Welcome activities are pervasive in the literature and are a valid way to attract students' interest and to begin to build a sense of community in the online environment. The most prevalent activities are welcoming messages from the instructor (audio or visual) coupled with course orientation (self-guided or tutorials) and introduction of the syllabus (Aragon, 2003; Dow, 2008; Mayne & Wu, 2011). Biographies are also another way for instructors to introduce themselves and often include a photo, a summary of interests, personal information, and inclusion of a video (Plante & Asselin, 2014). Similarly, participants in online courses are asked to introduce themselves with instructors modeling and scaffolding social presence activities (So & Brush, 2008).

Lowenthal and Dunlap (2010) suggest use of both a syllabus scavenger hunt and digital storytelling to pique learner's interest. The syllabus scavenger hunt serves as an orientation to the course while providing a scaffold to course expectations and materials. Digital story telling (Lowenthal & Dunlap, 2010) is incorporated to serve as a unique way to introduce oneself to the course participants as well as set up expectations for future assignments by providing experience with a creative method. Plante and Asselin (2014) suggest that a course preview prior to the start date can provide students with the opportunity to become familiar with course expectations and structure before interacting with peers. Previews can also serve as a way for students to have questions clarified prior to beginning the course and could potentially provide feedback to the instructor regarding the course design and expectations.

There are a variety of icebreaker type activities mentioned in the literature. These strategies initiate social presence by allowing participants to begin to engage in online transactional relationships. Icebreakers (Dixon, Crooks, & Henry, 2006) also assist participants in establishing norms for participation and collaboration. Icebreakers can be a stand-alone activity or they can integrate course content serving as a survey of knowledge individuals bring to the course. Mayne and Wu (2001) deliver an ungraded pre-lesson with feedback as a low stakes way for students to engage with material and learn the expectations of the course. A list of strategies by type and author for initiating social presence as extracted from the scoping review are presented in Appendix B.

As reported in the numerical analysis, the majority of online courses are asynchronous in nature and discussion forums are the typical method for engaging students in course participation. As such, there are specific behaviors and interaction patterns that the instructor should facilitate in order to increase immediacy and intimacy within an online learning environment. According to Ming-Shang, Wei-Hung, Chang, and Mei-Huei, (2012):

Even when using an effective system or function, students will not enjoy good interaction if the teacher does not express his or her views or participate at appropriate times. Particularly in distance learning environments, maintenance of student-teacher relationships depends entirely upon the teacher, who should strive to lessen the distance with students (p. 103-104).

As well, Aragon (2003) notes that students are inclined to participate more fully if there is an extrinsic reward for maintaining participation. Rovai (2007) suggests that between 10 to 20 percent serves as enough of a motivator and even when offered a higher percentage participation doesn't increase.

Much of the research from the scoping review highlighted the benefits of small group discussion. When groups were composed of eight or less participants it was found that student perception of social presence was higher (Ostlund, 2008). One important benefit of having smaller asynchronous discussion groups is the volume of messages become easier to navigate. By having a reduced number of posts, participants can potentially respond in greater depth to the message threads and thereby increase the quality of the discussion occurring.

There are a variety of discursive strategies a facilitator can use to create engaging discussions. It is important no matter the strategy employed to offer discussion protocols to alleviate boredom that can occur in asynchronous discussion. MacKnight (2000) goes on to note, that structured discussions offer the best opportunity to enhance student engagement. Another way is to employ constructivist-learning principles by assigning roles to the learners (Gulati, 2004). This empowers participants to bring their skills and knowledge into the forum to design and lead the weekly discussions based on the course content being covered. Rourke and Anderson (2002) found that peer teams had the potential to be more salient than instructor led discussions because of the increased preparation time spent. As well, Kanuka and Garrison (2004) found that an instructor with moderating skills can provide opportunities to support reason, discourse, and sustained critical dialogue in online learning environments, whether in teacher centered prompts for discussion or peer led groups.

With the limitations of CMC and the resultant lack of visual cues, it is important to compensate in the online environment. Rovai (2007) identified elements for both the facilitator and participants that are essential to include when participating in asynchronous discussions through the initiation and maintenance phase. First, the use of appropriate names and titles is essential. Using names is a simple way to build personal connection in discussion posts and to assist students in feeling that their contributions are valued (Rovai, 2007; Plante & Asselin, 2014). Second, is the importance of using personal phrases (e.g. hello or good morning participants) to show care and attention (Tu, 2000). Additionally, the use of inclusive language, paralinguistic, and emoticons (Tu, 2000) can make the learner feel more connected and part of the group because there is a real person behind the formality of the text they are viewing. It is important to note, that perceived privacy is also a concern for many. Thus, instructors must tactfully and sensitively consider how to deal with personal information, feedback, and assessment of learners.

Instructor immediacy has an impact on student learning and how feedback is communicated to students contributes to overall satisfaction and course success (Fisher, Frey, & Hattie, 2016). Some simple guidelines are to keep the feedback related to the assignments and academic progress (Aragon, 2003). Another is to consider what type of feedback is appropriate for the group and what should be directed in private to the individuals (Tu & McIsaac, 2002). Providing the learner with expectations in advance and an opportunity to feel like the instructor knows their work and ideas, honors their thoughts, feelings, and contributions, as well as addressing their concerns within a reasonable time frame (Tu, 2000).

Along with asynchronous discussion, an instructor may employ synchronous discussion options to increase social presence and potentially reduce isolation for participants and provide feedback to learners (Aragon, 2003; Mayne & Wu, 2001; Tucker, 2012). These meetings may take the form of phone calls, small group chat/video, or coffee shop style conversations, which may or may not be off limit to the instructor. As learners often choose distance courses because of the flexibility they offer, it is important not to rely on synchronous tools for the bulk of the course. Hosting scheduled monthly, optional meetings or holding meetings by request are suggested ways to engage learners. As well, synchronous video chats can convey personality and emotion. In addition, Borup, West, and Graham (2004) noted the importance of video feedback as this can alleviate misunderstandings and be perceived as more conversational. Finally, group coaching as method of feedback, can develop trust, improve knowledge acquisition, and transfer while enhancing commitment to the course and fellow students (Brown & Grant, 2010). Coaching and the resultant feedback can also increase social presence by enhancing interpersonal connections and motivation (Fluckiger, Vigil, Pasco, & Danielson, 2010). A list of strategies by type and author for maintaining social presence as extracted from the scoping review are presented in Appendix C.

LIMITATIONS

This study is limited by the data extracted and the manuscripts screened for inclusion, as it is specific to the parameters of the scoping review and therefore may not be exhaustive in nature.

CONCLUSION

Having a broad understanding of the definitions of social presence and how social presence affects online learning are crucial to building, initiating, and maintaining the construct for learners. Students in online learning environments want to feel they are connected to the group, they want their contributions recognized and valued by the group, and they want to participate in contextually relevant learning opportunities. In this respect, it is important to ensure that students' affective needs are not inhibited by the communication medium they have chosen. Recommendations for best practices in the building, initiating, and maintaining social presence, as garnered from the scoping review, are offered. Instructors need be cognizant of how best to effectively apply social presence to their courses and in turn model those practices, which strengthen student's learning in quality online learning environments. Future research should investigate the reconstitution of the social presence construct so that empirical validation of best practice guidelines offered for the creation and use of social presence in online learning environs can occur.

REFERENCES

- Aragon, S. R. (2003). Creating social presence in online environments. *New directions for adult and continuing education*, 2003(100), 57-68.
- Argyle, M., & Dean, J. (1965). Eye contact, distance, and affiliation. *Sociometry*, 28, 289-304.
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19-32.
- Billings, D. M., & Halstead, J. A. (2009). *Teaching in nursing: A guide for faculty*. St. Louis, MO: Saunders.
- Biocca, F., Harms, C., & Burgoon, J. K. (2003). Toward a more robust theory and measure of social presence: Review and suggested criteria. *Presence: Teleoperators and virtual environments*, 12(5), 456-480.
- Borup, J., West, R. E., & Graham, C. R. (2012). Improving online social presence through asynchronous video. *The Internet and Higher Education*, 15(3), 195-203.
- Bowers, J., & Kumar, P. (2015). Students' perceptions of teaching and social presence: A comparative analysis of face-to-face and online learning environments. *International Journal of Web-Based Learning and Teaching Technologies*, 10(1), 27-44.
- Brown, S. W., & Grant, A. M. (2010). From GROW to GROUP: Theoretical issues and a practical model for group coaching in organisations. *Coaching: An International Journal of Theory, Research and Practice*, 3(1), 30-45.
- Chen, X., Fang, Y., & Lockee, B. (2015). Integrative review of social presence in distance education: Issues and challenges. *Educational Research and Reviews*, 10(13), 1796-1806.
- Cui, G., Lockee, B., & Meng, C. (2013). Building modern online social presence: A review of social presence theory and its instructional design implications for future trends. *Education and Information Technologies*, 18(4), 661-685.
- Danchak, M. M., Walther, J. B., & Swan, K. P. (2001). Presence in mediated instruction: Bandwidth, behavior, and expectancy violations. Paper presented to the *Annual Meeting on Asynchronous Learning Networks*, Orlando, FL.
- Dixon, J., Crooks, H., & Henry, K. (2006). Breaking the ice: Supporting collaboration and the development of community online. *Canadian Journal of Learning and Technology*, 32(2).
- Dow, M. J. (2008). Implications of Social Presence for Online Learning: A Case Study of MLS Students. *Journal of Education for Library and Information Science*, 49(4), 231-242.
- Fisher, D., Frey, N., & Hattie, J. (2016). *Visible Learning for Literacy, Grades K - 12*. Thousand Oaks, CA: Corwin, Sage Publications.
- Fluckiger, J., Vigil, Y. T. Y., Pasco, R., & Danielson, K. (2010). Formative feedback: Involving students as partners in assessment to enhance learning. *College teaching*, 58(4), 136-140.
- Garrison, D. R. (2009). Communities of inquiry in online learning. In *Encyclopaedia of Distance Learning*, 2nd Edition (pp. 352-355). IGI Global.

- Garrison, D. R., Anderson, T., Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105.
- Garrison, D. R., Cleveland-Innes, M., & Fung, T. S. (2010). Exploring causal relationships among teaching, cognitive, and social presence: Student perceptions of the community of inquiry framework. *The Internet and Higher Education*, 13(1), 31-36.
- Gulati, S. (2004, April). Constructivism and emerging online learning pedagogy: a discussion for formal to acknowledge and promote the informal. In *Proceedings of the Conference of the Universities Association for Continuing Education*, London, England.
- Gunawardena, C. N. (1995). Social presence theory and implications for interaction and collaborative learning in computer conferences. *International Journal of Educational Telecommunications*, 1(2/3), 147-166.
- Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *The American Journal of Distance Education*, 11(3), 8- 26.
- Kanuka, H., & Garrison, D. R. (2004). Cognitive presence in online learning. *Journal of Computing in Higher Education*, 15(2), 21.
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288.
- Kim, J., Kwon, Y., & Cho, D. (2011). Investigating factors that influence social presence and learning outcomes in distance higher education. *Computers and Education*, 57, 1512-1520.
- Kreijns, K., Kirschner, P. A., & Vermeulen, M. (2013). Social aspects of CSCL: A research framework. *Educational Psychologist*, 48(4), 229-242.
- Kreijns, K., van Acker, F., Vermeulen, M., & van Buuren, H. (2014). Community of Inquiry: Social presence revisited. *E-Learning and Digital Media*, 11(1), 5-18.
- Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, 5(1), 1-9.
- Lowenthal, P. R. (2010). The evolution and influence of social presence theory on online learning. In Kidd, T. (Ed.), *Online education and adult learning: New frontiers for teaching practices* (pp. 124-139).
- Lowenthal, P. R., & Dunlap, J. C. (2010). From pixel on a screen to real person in your students' lives: Establishing social presence using digital storytelling. *Internet and Higher Education*, 13(1), 70-72.
- Lowenthal, P. R. (2012). Social presence: What is it? How do we measure it?. Available from ProQuest Dissertations & Theses Global. (1014403528). Retrieved from <http://cyber.usask.ca/login?url=https://search-proquest-com.cyber.usask.ca/docview/1014403528?accountid=14739>
- MacKnight, C. B. (2000). Teaching critical thinking through online discussions. *Educause Quarterly*, 23(4), 38-41.
- Mayne, L. A., & Wu, Q. (2011). Creating and Measuring Social Presence in Online Graduate Nursing Courses. *Nursing Education Perspectives*, 32(2), 110-114.

Ming-Shang, H., Wei-Hung, H., Chang, T. S., & Mei-Huei, H. U. (2012). Design and implementation of a cooperative learning system for digital content design curriculum: Investigation on learning effectiveness and social presence. *TOJET: The Turkish Online Journal of Educational Technology*, 11(4).

Moallem, M. (2015). The impact of synchronous and asynchronous communication tools on learner self-regulation, social presence, immediacy, intimacy, and satisfaction in collaborative online learning. *The Online Journal of Distance Education and e-Learning*, 3(3), 55.

Östlund, B. (2008). Prerequisites for interactive learning in distance education: Perspectives from Swedish students. *Australasian Journal of Educational Technology*, 24(1).

Peters, M. D, Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *International Journal of Evidence-Based Healthcare*, 13(3), 141– 146.

Plante, K., & Asselin, M. E. (2014). Best practices for creating social presence and caring behaviors online. *Nursing Education Perspectives*, 35(4), 219-223.

Rafaeli, S. (1988). From new media to communication. *Sage Annual Review of Communication Research: Advancing Communication Science*, 16, 110-134.

Rafaeli, S. (1990). Interacting with media: Para-social interaction and real interaction. *Mediation, information, and communication: Information and Behavior*, 3, 125-181.

Rettie, R. (2003). Connectedness, awareness, and social presence. Paper presented at the 6th International Presence Workshop, Aalborg University, Aalborg, Denmark.

Robb, C. A., & Sutton, J. (2014). The importance of social presence and motivation in distance learning. *Journal of Technology, Management, and Applied Engineering*, 31(1-3), 1-10.

Rourke, L., & Anderson, T. (2002). Using Peer Teams to Lead Online Discussions. *Journal of Interactive Media in Education*, 1. doi:10.5334/2002-1

Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London, England: John Wiley & Sons

Rourke, L., Anderson, T., Garrison, R. D., & Archer, W. (2001). Assessing social presence in asynchronous text-based computer conferencing. *Journal of Distance Education*, 4(21), 50-71.

Rovai, A. P. (2007). Facilitating online discussions effectively. *Internet and Higher Education*, 10(1), 77-88.

So, H-J., & Brush, T. A. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers and Education*, 51, 318-336.

Stein, D. S., Wanstreet, C. E., Glazer, H. R., Engle, C. L., Harris, R. A., Johnston, S. M., & Trinko, L. A. (2007). Creating shared understanding through chats in a community of inquiry. *The Internet and Higher Education*, 10(2), 103-115.

Tu, C.H. (2000). Strategies To Increase Interaction In Online Social Learning Environments. In D. Willis, J. Price; J. Willis (Eds.), *Proceedings of SITE 2000--Society for Information Technology & Teacher Education International*

Conference, (pp. 1662-1667). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).

Tu, C. H. (2005). *Computer-mediated communication questionnaire*. Flagstaff, AZ: Author.

Tu, C. H., & McIsaac, M. S. (2002). An examination of social presence to increase interaction in online classes. *American Journal of Distance Education*, 16(2), 131-150.

Tu, C. H., & Yen, C. J. (2006). A study of multidimensional online social presence. In L. W. Cooke (Ed.), *Frontiers in higher education* (pp. 77-104). Hauppauge, NY: Nova Science.

Tucker, S. Y. (2012). Promoting Socialization in Distance Education. *Turkish Online Journal of Distance Education*, 13(1), 174-182.

Wiener, M., & Mehrabian, A. (1968). *Language within language: Immediacy, a channel in verbal communication*. New York, NY: Appleton-Century-Crofts.

Yen, C. J., & Tu, C. H. (2008). Online social presence. *Quarterly Review of Distance Education*, 9(3), 297.

Appendix A

Building Social Presence	Author (s)	Recommendations/Benefits
Facilitator Competencies	Hughes et al. (2007, p. 19) Plante (2014, p. 221) Cui 2013, p. 678.	-feedback, structure the learning process, -need for faculty to be flexible and manage diversity, ambiguity, and conflict. -significant training for OL instructors - ADDIE – model of instructional design
Safe Environment	Mayne & Wu (2011, p. 113) Gallagher-Lepak et al. as in Plante (2014, p. 220)	- setting boundaries for confidentiality and professionalism online and creating a safe environment built on trust - respectful, positive, encouraging, constructive, timely, empathetic, understanding, sensitivity,
Limit Class Size	Aragon (2003, p. 62)	-Lurking possible with large numbers, -large class size decreases social presence
Course Information and Expectations in Advance	Mayne & Wu (2011, p. 113)	- announcements “begin here; help links” -Inclusive syllabus; timelines, due dates, course expectations, learner/teacher role, rubrics for evaluation of assignments, self-evaluation rubrics (all in advance) -contingency plans for problems and issues -links to common sites, librarian. -resources section
Ongoing Evaluation of SP in OLE	Vrasidas & McIsaac (2000); as in Cui 2013, p. 678	-without access to facial expressions, voice intonation, or body language, online evaluation methods are varied including gathered information from students’ weekly

Feedback to the teacher		assignment, students' moderations of online discussions, students' postings in online conferences, their final papers, and presentations, and so on. A thorough [ongoing] evaluation will help to find out whether the desired level of social presence has been achieved under the current situation.
Structured Collaborative Activities (Asynchronous discussions & Assignments)	Ostlund (2008, 48); Tu (2002 p. 1665) Mayne & Wu (2011, p. 113) So, H. & Brush, T (2008)	-limit discussion group size -discussion becomes too dense limits SP -small group discussion limit at 8. -medium perceived as less public = higher SP (varies with # of participants) -asynchronous seating charts groups formed based on student-submitted info on interests and experience; used for asynchronous interactions. (pre-course questionnaire, pre-assessment questions) -periodically throughout the course -feedback on perceptions of SP. What teacher could do to enhance. -questions on learning.
Choice (Androgogy)	Cunnin et al. (2011, p. 43)	-engagement in content, review more than post. Provide opinion and consider values, beliefs, and opinions rather than prescribed answers.
Time	Ostlund (2008, p. 54)	-active participation and/or flexibility

Appendix B

Initiating Social Presence	Author (s)	Recommendations/Benefits
Safe Environment	Gunawardena (1995)	-cultural background should be honored and considered when tying and time spent to explain idioms and colloquial language if necessary. -build a safe and friendly environment -course preview: an invitation to look around and have questions answered. Increases familiarity with expectations, materials, and structures before interacting with peers, lessons, and content. -course & Syllabus Scavenger Hunt; use quiz features in LMS to complete by the end of the first week as an orientation.
Welcome Messages Audio/Video	Aragon (2003, p. 62) Dow (2008, p. 238) Mayne & Wu (2011, p. 113) Plante & Asselin (2014, p.	-course orientation, basic online social skills training, etiquette for OL discussion, expectations -instructor biography, photo, video, personal information. -digital story telling Digital Story Telling

	220) Gunawardena (1995) Lowenthal (2010)	-variety of activities at the beginning of the course to assist participants in forming a community of learners. Establishes norms for participation and collaboration. Can be related to content or serve to build social capital.
Icebreakers	Dixon et al. (2006)	-pre-Course Activities- Introductions, personal interests/experience. -announcements with “begin here” links and/or links to tutorials on how to use the cite and the resources. -orientations – with videos.
Tutorials	Mayne & Wu (2011, p. 13) Lowenthal (date, n.p.)	-modelling and scaffolding social presence behaviours for participants in the distance learning environment.
Modelling	So & Brush (2008)	-5-minute conversations at the beginning of a course reduces isolation.
Audio/Video	Lowenthal & Dunlap, (2010)	-expectations established when designing the course, facilitators can begin to analyze posts to see who is contributing, who needs prompting, and if students need support. -contribute to discussion boards, promptly answer e-mails, enter in conversations.
Participant Responsibilities	Aragon (2003, p. 66)	-ungraded pre-lesson with feedback: low stakes way to enable participant to learn what is expected for posts and receive valuable feedback to guide him/her through the course and increases performance. -personalized, detailed feedback.
Feedback: Initial Assignment	Mayne & Wu (2011, p. 13) in Cui et al. (2013, p. 678) Lowenthal & Dunlap, (2010)	-actively involved (initiate, respond appropriately to discussions, debrief and close activities) assists with establishing a social connection with students. -acknowledge each post in first weeks to establish social presence and make learners feel part of the community.
Establish Facilitator Involvement and Communication Patterns	Aragon (2003, p. 62-64) Gunawardena (1995, p. 158). Lowenthal & Dunlap, (2010)	-timely responses on e-mail “valuable to the establishment of social presence”. Students feel questions are valid and eases anticipation of beginning a new course. -one to one and group e-mails.

Appendix C

Maintaining Social Presence	Author (s)	Recommendations/Benefits
Asynchronous Discussions	Ming-Shang, H., et al. (2012, p. 113-114)	-facilitator and participant contributions establish and maintain social presence.
	Aragon (2003, p. 63-64)	Teacher responsibility to maintain student-teacher relationships, strive to lessen the distance.
	Mayne & Wu (2011, p. 113)	-groups > 8; social presence is greater in smaller groups. Extrinsic Reward 10-20 % of final grade allocated for participation.
	Tucker (2012, p. 180)	-peer Facilitated discussions- participants take on roles and plan and lead weekly discussions.
	Rovai (2007, p. 83) Rourke & Anderson (2002, p. 5)	-virtual seating charts with general personal information

	Ostlund (2008)	<p>about participants (student posted bios) for the group to use in their interactions.</p> <p>Emphasis on student dialogue. Instructor facilitates discursive strategies. Focus on construction of knowledge. Provide closure or debrief discussion threads.</p> <p>-tactfully/privately deal with dominating posters or conflict (e-mail or phone call).</p>
Feedback	Aragon (2003, p. 64) Rovai (2007, p. 83)	<p>-feedback related to assignments, participation, and academic progress.</p> <p>Individual personalized feedback establishes social presence by showing value for the student and his or her work.</p> <p>-positive and prompt feedback</p>
	Aragon (2003, p. 64) Tu (2002, p. 1665)	<p>-feeling like ideas, thoughts, questions, concerns & contributions matter</p> <p>-instructor immediacy has impact on student learning and satisfaction</p> <p>-any style of communication; unless time limit specified only allow 24-hour window for responses.</p>
	Borup, West, Thomas & Graham (2004)	<p>-visual cues in video feedback allowed for emotional expressions that are not possible in written form. Assists with avoiding misunderstandings and is more conversational.</p>
Coaching	Stein et al. (2013, p. 79)	<p>-a learning environment that incorporates continuous coaching helps students become more independent. e-coaching considered a developmental partnership enabled through CMC over e-mail, chat, or online discussion. group coaching seen as a way to develop trust and support within groups, improve communication, support greater commitment and improve knowledge transfer. (brown & grant, 2010)</p>
Synchronous meetings (chat, audio, video)	Aragon (2003, p. 64) Mayne & Wu (2011, p. 113) Tucker (2012, p. 180)	<p>-synchronous meetings increase social presence and reduce feelings of isolation.</p> <p>-periodic; tailor to needs of individual or group</p> <p>-option for a “coffee shop” style conversation; can be off limits to instructor.</p>
Communication skills	Tu (2000, p. 5) Lowenthal (2012, p. 5)	<p>-appropriate names/titles</p> <p>-personal stories</p> <p>-human phrases</p> <p>-emoticons</p> <p>-paralanguage –stimulating, sensitive and expressive</p>
Perceived Privacy	Tu & McIsaac (2002)	<p>-sensitivity and care must be taken within the CMC. Personal information should be shared privately with the individual and only general comments shared with groups.</p>

Effectiveness of Using Stop, Think and Talk Activities on the Performance of Students in Reading Comprehension in Junior Secondary Schools in Federal Capital Territory (Fct) Abuja

Hanna Onyi YUSUF

Department of Educational Foundations and Curriculum

Faculty of Education Ahmadu Bello University,

Zaria, Nigeria

hannayusuf@yahoo.com

ABSTRACT

The study was carried out to determine the effect of stop, think and talk activities on the performance of students in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja. The study was carried out using a quasi-experimental pretest-posttest research design. The target population of the study comprised of 16,925 JSII students. A sample size of 100 JSII students from two secondary schools in the Federal Capital Territory (FCT) Abuja, were purposely sampled in the study. Sixty five (65) students from Government Junior Secondary School, Apo and thirty five (35) from Government Junior Secondary School, Garki were used for the study. Both groups of students were taught for six (6) weeks. Government Junior Secondary School, Apowa was assigned as the experimental group while Government Junior Secondary School, Garki was assigned as the control school. Students were pre-tested to establish their homogeneity before the commencement of the treatment. They were taught for six (6) weeks and were tested using retelling test as an instrument. Data collected from students' test scores was analysed using mean and standard deviation, while t-test was used to test the formulated null hypothesis at 0.05 level of significance. Findings of the study revealed that "stop, think and talk" activities had significant effect on students' performance in reading comprehension. In fact, the experimental group which was exposed to stop, think and talk activities had better understanding of the reading comprehension passages given to them. The result further revealed that students in experimental group were more active, responsive and paid more attention to details concerning the main ideas in the passages read. Based on the findings, it was recommended that teachers should be encouraged to use "stop, think and talk" activities in reading comprehension lessons. Such activities should be provided before, during and after every reading comprehension passage to enhance and facilitate students' reading abilities. Curriculum planners should provide activities that would encourage students to "stop, think and talk" to make reading comprehension lesson more purposeful and meaningful.

Keywords: Reading, Comprehension, Performance, Activities, Effectiveness

INTRODUCTION

Comprehension is intentional thinking during which meaning is constructed through interactions between texts and readers. It is a process in which readers construct meaning by interacting with text through the combination of prior knowledge and previous experience (Pardo, 2004). Comprehending a text involves two phases, that is, construction and integration. In phase one of this process, the reader constructs meaning from text and in the second phase integrates this newly constructed knowledge into the existing prior knowledge network. Reading is a crucial form of communication through which the information required in teaching and learning situations and in everyday life can be acquired (Adeniji, & Omale, 2010). The teaching of reading needs to include a range of comprehension strategies. Although learning to translate letters into words is extremely important. Comprehension strategies involve the mental processes that good readers use to understand text (Yusuf, 2009). There are various factors militating against the effective teaching and learning of reading comprehension in schools. Researchers (Yusuf 2016, 2013, Oyetunde 2009) have shown in their researches conducted in Nigeria, that poor methodology is one of the main causes of children's reading failure. According to them, children are failing to learn to read because they are not being taught reading in any meaningful way.

Oyetunde and Unoh cited in Adeniji and Omale (2010) highlighted some impediments to positive reading habits and attitude. These include lack of materials, poor preparation of teachers, lack of interest, poor libraries or none at all, home background, poor method of teaching and lack of adult readers as models. Hence, teachers are always in search of enhanced methods of reading comprehension. Many children in Nigeria do not have the foundational skills such as word recognition, vocabulary development, and prior experiences that are considered necessary to connect text with meaning (Yusuf 2013, 2016). All of the foregoing have necessitated the need to constantly carry out researches to find possible solutions to the perennial reading problems of children in Nigeria. It is against this background that this study was undertaken.

BACKGROUND TO THE STUDY

Stop, think and talk activities are time-tested. These teaching strategies have been used for years to help students learn how to monitor their own thinking (Wilhelm, 2001). The stop, think and talk strategy helps students monitor their thinking and understanding of the text. This helps to improve students' comprehension. As they think aloud, they internalize what they are saying, which helps them learn. To begin, the teacher must model this strategy by orally communicating what they are thinking as they read. As teacher reads the text, she/he stops at certain points that may be confusing or challenging for students. Allow time for students to practice asking questions to themselves as they read the text. This can be done individually, with a partner, or in a small group.

Stop, think and talk activities are practical and relatively easy for teachers to use within the classroom. Teachers are able to model the stop, think and talk activities and discuss how good readers often re-read a sentence, read ahead to clarify, and/or look for context clues to make sense of what they read. Stop, think and talk activities slow down the reading process and allow students to monitor their understanding of a text (Wilhelm, 2008). Stop, think and talk activities help students learn to monitor their thinking as they read an assigned passage (Ann & Friedman, 2017). Students are directed by a series of questions which they think about and answer aloud while reading. This process reveals how much they understand a text. As students become more adept at this technique they learn to generate their own questions to guide comprehension.

Teaching reading comprehension using the stop, think and talk activities start with the listening, following directions, asking for help, ignoring distractions, and dealing with teasing skills and then move to other skills that students need to master (Wilhelm, 2001). As students continue to learn and use the skills in the stop and think activities, they will be able to make more good choices, more easily and more independently. Over time, they will become more effective self-managers, which can promote their comprehension reading skill. Although the use of stop, think and talk activities is widespread, existing quantitative research evidence for its effectiveness is limited. In view of this, further investigation is needed to determine its effectiveness in teaching reading comprehension. Therefore, this study was carried out to determine the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja.

Review of Related Literature

Teaching strategies are important only if they assist readers to comprehend and respond to text. In other words, stop, think and talk activities are a useful strategy when they help a reader through their zone of proximal development, assisting students to develop a particular strategy or set of strategies that student can yet use independently, and when these strategies help student to engage with a text important to their current purposes. Reading is more than just decoding, or sounding out words (Clum, 2005). Reading is also thinking about the words so as to understand them. A good reader for instance, think to understand what they are reading. Comprehension is the understanding and interpretation of what is read. To be able to accurately understand written material, children need to be able to (1) decode what they read; (2) make connections between what they read and what they already know; and (3) think deeply about what they have read (Readingrockets.com, 2016). Reading comprehension according to Reading Study Group (2002) involves four components: (1) the reader, (2) the text, (3) the activity, and (4) the situational context. The first three essential components that is, the reader, the text, and the task occur within the fourth component of reading comprehension—the situational context. The reader is the one doing the comprehending, and the text is the reading material (such as, stories, nonfiction selections, and so forth).

The activity refers to what kind of comprehension task, skill, strategy, or concept the reader is attempting to perform (such as, discovering the author's main idea, understanding a sequence of events, thinking about a character's intent in a story, and so forth).

The situational context of reading comprehension can be thought of in at least two ways. First, the actual setting where reading occurs at home, in a school classroom, the library, under a blanket at bedtime and so forth, affects how well one comprehends while reading. There is little doubt that children's reading comprehension is influenced by the setting in which they read (for instance, reading alone at home than if called on to read during a class activity could make children feel more focused and relaxed). Second, there is a social context associated with reading comprehension. In some cases, reading comprehension occurs individually. In other cases, however, reading comprehension can be part of a vibrant social activity in which people, teachers, parents, and children, read a text together and jointly construct meaning through discussion. Lively interaction about a text in the company of others seems to be the optimal situational context to enhance students' reading comprehension (Beck, & McKeown, 2006).

The stop, think and talk process is simple as the teacher verbalizes what she/he is thinking then reads or figures out a problem. In turn, students get a glimpse into the mind of a skilled reader or problem solver. A classic study by Bereiter and Bird cited in Nell and Pearson (2000) showed that students who were asked to stop and think while reading had better comprehension than students who were not taught to stop and think according to a question and answer comprehension test. Effective teachers have been using this method for decades, as they model what they are thinking, so students can understand the process of how skilled readers can construct meaning from the text.

Initially, the teacher reads the selected passage as the students read the same text silently. At certain points the teacher stops and "thinks aloud" answers to some of the pre-selected questions (Howard, 2001; Ortlieb & Norris, 2012). Teachers should demonstrate how good readers monitor their understanding by re-reading a sentence, reading ahead to clarify, and/or looking for context clues. Students then learn to offer answers to the questions as the teacher leads the stop, think and talk activities, students become familiar with the stop, think and talk process, they may work individually or in small groups. Teachers may choose to have students write down responses to the stop, think and talk activities which provide a record of learning.

Objective of the Study

Therefore, the purpose of this study is to determine the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in the Federal Capital Territory (FCT) Abuja, Nigeria

Research Question

What is the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja?

Research Hypothesis

There is no significant difference in the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja.

Methodology

The study was carried out using a quasi-experimental pretest-posttest research design. The target population of the study is sixteen thousand nine hundred and twenty five (16,925) JSII students. A sample size of one hundred (100) JSII students from two secondary schools in the Federal Capital Territory (FCT) Abuja, were purposely sampled in the study. Sixty five (65) students from Government Junior Secondary School, Apo and thirty five (35) from Government Junior Secondary School, Garki were used for the study. Government Junior Secondary School, Apo was assigned as the experimental group while Government Junior Secondary School, Garki was assigned as the control school. Students were pre-tested to establish their homogeneity before the commencement of the treatment.

The experiment lasted for six (6) weeks before students were tested using retelling test as an instrument. Data collected from students' test scores were analysed using mean and standard deviation, while t-test was used to test the formulated null hypothesis at 0.05 level of significance.

Treatment

- Teacher encourages students to set a purpose for reading.
- Teacher motivates students to activate their background knowledge by asking relevant previous knowledge questions.
- Teacher guides students to stop, think and talk to their brains as they read the first paragraph of the reading comprehension passage.
- Teacher guides students by asking series of questions which they think about and answer aloud while reading.
- Teacher guide students to stop, think and talk to their brains as they read second, third and fourth paragraphs of the reading comprehension passage.
- Teacher encourages students to make themselves part of the story by visualizing and creating their own images in their brains as they engage in stop, think and talk activities.
- Teacher takes students back into the text to synthesize a coherent view of the text as a whole as they read through the passage from beginning to the end.
- Teacher guide students to make generalisations that goes beyond the text using stop, think and talk activities.
- Teacher encourages students to stop, think and talk to their brains as they read the passage all over again.

Data Analysis and Results

Descriptive statistics of mean and standard deviation was used to analyse the research question raised in the study. The analyses are presented as follows:

Research Question: What is the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja?

Table 1: Descriptive statistics on the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja

Method	N	Pre-test Scores		Post-test Scores	
		Mean	SD	Mean	SD
Experimental Group	65	31.47	9.02	51.33	10.35
Control Group	35	30.48	9.88	31.50	6.94

Table 1 shows the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja. The mean scores as displayed shows that students taught reading comprehension using stop, think and talk activities had a better performance mean scores in their pre-test and post-test. For instance, the mean score of students taught reading comprehension using stop, think and talk activities increased from 31.47 to 51.33 with corresponding standard deviation of 9.02 and 10.35, while the mean score of students in control group increased from 30.48 to 31.50 with standard deviation of 9.88 and 6.94 respectively. This shows the pre-test mean scores difference of 0.99 and post-test mean scores difference of 19.83. It also shows the mean gain of 19.86 for students in experimental group and mean gain of 1.02 for students in control group. The standard deviation at each level indicates that students' performance varied widely from each other.

Hypothesis: There is no significant difference in the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja. The post-test administered on students was marked, scored and tested using independent sample t-test. The summary of the analysis is presented in Table 2:

Table 2: Summary of Independent sample t-test on the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja

Method	N	Mean	SD	Df	α	t-cal	t-crit	Sig. (2-tailed)	Decision
Experimental	65	51.33	10.35	98	0.05	5.96	1.96	.001	Rejected
Control	35	31.50	6.94						

Table 2 shows that the students taught reading comprehension using stop, think and talk activities performed far better than their counterparts in control group in junior secondary schools in Federal Capital Territory (FCT) Abuja. The table shows that the t-calculated value of 5.96 is greater than the t-critical 1.96, while the p-value is .001 ($P < 0.005$). The null-hypothesis which states that there is no significant difference in the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja was rejected. The implication of this result is that the students exposed to stop, think and talk activities had better understanding of the reading comprehension passages given to them. In fact, students in the experimental group were more active, responsive and paid more attention to details concerning the main ideas in the passages read.

DISCUSSION of FINDINGS

This section briefly discussed the findings from the hypothesis tested in the study. Findings of the study revealed that the students taught reading comprehension using stop, think and talk activities performed far better than their counterparts in control group in junior secondary schools in Federal Capital Territory (FCT) Abuja. Therefore, the null-hypothesis which states that there is no significant difference in the effect of stop, think and talk activities on students' performance in reading comprehension in junior secondary schools in Federal Capital Territory (FCT) Abuja was rejected. This finding corroborates the findings of Ortlie and Norris (2012) that the use of think-aloud helps to enhance students' abilities of the thinking process thereby facilitating their comprehension of reading task. It also allows readers to connect meaning and understanding with written texts.

CONCLUSION

Comprehension is a consuming, continuous, and complex activity, but one that, for good readers, is both satisfying and productive. Teaching reading comprehension using stop, think and talk activities has been proven to be effective in this study. The use of stop, think and talk activities stimulates students thinking process, thereby, facilitating and enhancing their comprehension and thinking process. Based on the findings of this study, one can conclude that students exposed to stop, think and talk activities had better understanding of the reading comprehension passages given to them. Therefore, teachers can promote students' reading comprehension by engaging students in stop, think and talk activities.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Teachers should be encouraged to use "stop, think and talk" activities in reading comprehension lessons. Such activities should be provided before, during and after every reading task to enhance and facilitate students' comprehension.
2. Curriculum planners should provide activities that would encourage students to "stop, think and talk" to make reading comprehension lessons more purposeful and meaningful.

REFERENCES

- Adeniji, M. A., & Omale, A. (2010). Teaching Reading Comprehension in Selected Primary Schools in Oyo State, Nigeria. *Library, Philosophy and Practice*. Retrieved from <http://www.webpages.uidaho.edu/~mbolin/adeniji-omale.htm>
- Ann, B., & Friedman, T. L. (2017). *Classroom Strategies: Think alouds*. Family Foundation and Carnegie Corporation of New York. Retrieved from <http://www.adlit.org/strategies/22735/>
- Beck, I., & McKeown, M. (2006). *Improving comprehension with questioning the author: A fresh and expanded view of a powerful approach*. New York: Scholastic.
- Clum, A. (2005). *Strategies for Comprehension*. Michigan: Frank Schaffer Publication
- Howard, M. K. (2001). *The Stop & Think Social Skills Program: Teacher's Manual for Grades 4–5*. Retrieved on 24/04/2017 from www.sopriswest.com/stopandthink
- Nell, D., & Pearson, D. (2000). Effective practices for developing reading comprehension. *Reading Research Quarterly*, 205-2015
- Ortlied, E., & Norris, M. (2012). Using the Think-Aloud Strategy to bolster reading comprehension of science concepts. *Current Issues in Education*, 15(1). Retrieved from <http://cie.asu.edu/ojs/index.php/cieatasu/article/view/890>
- Pardo, L. S. (2004). What every teacher needs to know about comprehension. *International Reading Association*, 58(3), 272-280.
- Readingrockets.com (2016). *Comprehension*. Retrieved on 26/04/2017 from <http://www.readingrockets.org/helping/target/comprehension>
- The Literacy Web (2001). *Myriad resources for teaching reading comprehension*. Retrieved on 21/04/2017 from <http://www.literacy.uconn.edu/compre.htm>
- Wilhelm, J. D. (2001). *Improving Comprehension with Think-Aloud Strategies*. New York: Scholastic Professional Books.
- Wilhelm, J. D. (2008). *National Writing Project. Navigating Meaning: Using Think-Alouds to Help Readers Monitor Comprehension*. Retrieved 2008, March 5, from <http://www.nwp.org/cs/public/print/resource/495>
- Yusuf, H.O. (2009). Strategies for Improving the Teaching of Reading Comprehension in Primary Schools. *Journal of Educational Research and Development*, Faculty of Education, ABU, Zaria, 4(3), 63-68.
- Yusuf, H.O. (2013) "Influence of vocabulary instruction on students' performance in Reading Comprehension" *International Journal of Research in Arts and Social Science Education*; Department of Arts and Social Science Education; Ahmadu Bello University Zaria Vol. 2 (1). PP 132-139 July 2013
- Yusuf, H.O. (2016) "Effectiveness of Using Creative Mental Images in Teaching Reading Comprehension in Primary Schools in Nigeria". *American Journal of Educational Research*, University of Houston, United States of America (USA). Vol. 4 (1) PP 18-21 January 2016.

Effects of Health Education on Cigarette Smoking Habits Among Health Professional Students

Elif DEMIRKIRAN

*Istanbul University,
Institute of Health Sciences,
Public Health Department,
Istanbul-Turkey*

Hülya GÜL

*Corresponding Author,
Istanbul University,
Istanbul Faculty of Medicine,
Public Health Department,
Fatih, Istanbul-Turkey*

ABSTRACT

Introduction: In control of cigarette smoking, health professionals play a key role because of their professional responsibilities and knowledge. In this study, it was aimed to examine the effect of health education on the level of knowledge about smoking and dependence of cigarette smoking among first and last year students of different faculties in a health university.

Methods: This descriptive type of research was organized by participation of first and last year of a private university Dental, Pharmacy and Nursing Departments' students. 255 (82.5%) were reached out of total 309 enrolled students. Participant smoking status and smoking related college education were questioned and the Fagerstrom Nicotine Dependence Test was administered under observation. Pearson Chi Square, Binary Logistic Regression model and Spearman correlation were used for data analysis.

Results: The prevalence of smoking among students was 26.3% in total; 55.2% in males, 19.9% in females, 65.7% in first grade and 34.3% in last grade. In our study; significant relations were revealed between smoking and grade, gender, close friend's smoking status, use of alternative tobacco products, getting smoking related health education ($p<0.05$).

Conclusion: As a result; it is observed that health education; given about the health effects and control of tobacco during college had a positive effect on awareness and reduction of frequency of smoking.

Key Words: Smoking, addiction, education, university, health professions student.

INTRODUCTION

Tobacco use is one of the biggest public health problems the world has ever faced, causing 6 million deaths a year. According to World Health Organization (WHO) data, from 6 millions deaths; more than 5 million deaths are caused by direct tobacco use, and more than 600 thousand deaths are caused by exposure to cigarette smoke (1,2). Ischemic heart disease, cerebrovascular disease, cancers and chronic respiratory system diseases are among the top 10 in 'the disability-adjusted life year (DALY)' and lead to the death of three out of every five people; and cigarette consumption is an important and only common factor affecting all of these diseases (3,4). Consequently; it has been estimated that about 55,000 deaths attributable to tobacco use in one year, can be avoided with tobacco control studies (5).

According to the World Health Organization's Tobacco Use Prevalence 2015 Global Report, the rate of tobacco use in Turkey is 26% (approximately 14 million 892 thousand) in 2015 (4). In the period of students' college years, which is defined as late adolescents (17-24 years) by WHO, one out of every five people use tobacco products and this period is defined as the most risky period for the development of smoking and similar addictions (6).

According to the Centers for Disease Control and Prevention (CDC) statistics, in the US alone, everyday more than 3,200 people under the age of 18 are starting to smoke for the first time and more than 2100 adolescents become daily smokers from infrequent cigarette smoking (7).

Some studies report that smoking prevalence continues to increase among university students. There are many factors why this growing tendency among university students is seen; such as stress alleviation, feelings of loneliness, life problems, peer pressure, societal acceptance desire, low education level of parents and desire for self-assurance (8).

The Role of Health Professionals and Education in Smoking Control

Through their professional activities, health professionals, be able to guide the patients about tobacco use and its health effects, assume the role of educational position, can serve as a reference to educate the media and policy makers in this area, and play a national and international role for a better tobacco control policy. It is important that community-respected health professionals actively participate in the systematic implementation of tobacco control with a multi-sectoral structure (9).

As a result of a meta-analysis based on "Tobacco Use and Addiction Treatment Practice Guidelines", when a health care professional intervenes to quit tobacco use, the quit rate is 1.8 times higher than the uninvolved case. A tobacco quitting counseling by a health professional for at least 3 minutes is 1.3 times higher than no counseling; and consulting for more than 10 minutes has resulted in 2.3 times more tobacco quit rate (10). The education on smoking cessation will be an ideal opportunity to provide support to students who are also trying to quit smoking, while at the same time preparing them for their professions (11). Thus, healthcare professionals will play a role in reducing tobacco use of their future patients and ultimately reducing smoking-related deaths by gaining the ability to quit smoking (12).

MATERIAL AND METHODS

The study is a cross-sectional study of descriptive type. The universe consists of a total of 309 students who study in the first and last grade of dental medicine faculty, pharmacy faculty and health science faculty nursing department of a private university. After the objectives of the research were explained, the questionnaire was applied to all the students under observation who volunteered to participate. During the study, there were students who were absent or on leave, as a result a total of 255 (82.5%) students participated in the study.

The data were collected by a questionnaire consisting of 39 multiple-choice questions prepared by researchers in the light of current literature and via the Fagerstrom Nicotine Dependence Test (13).

In the first part of the questionnaire, socio-demographic characteristics such as gender, education and family status of all participants, in the second part; smoking and quitting status of only smokers, in the third part; knowledge level of smoking-illness relation and education about smoking in faculty of all students have been queried. Finally, Fagerstrom Nicotine Dependence Test was administered to smokers.

Fagerstrom Nicotine Dependence Test; is a test administered to determine nicotine addiction levels of smokers. The reliability and factor analysis of the Turkish version was made by Uysal et al. According to the Fagerstrom Nicotine Dependence Test results, levels of nicotine dependence are as follows: 0-2 points = Very low dependence / 3-4 points = Low dependence / 5 points = Moderate dependence / 6-7 points = High dependency / 8-10 points = Very high dependency "(13).

The greatest limitation of the study was that the surveys were only applicable during course hours and having small number of sample size because of the small number of enrolled senior students. The results of this study have limited generalization to their own universe.

The evaluation of the data was performed on a computer using the Statistical Package for Social Sciences (SPSS) for Windows 21.00 package program. In the study, the distribution and percentage tables were determined first and then the chi-square test was used to determine the significance level of the differences between the grouped variables. A statistical significance level of $p < 0.05$ was accepted.

Statistical evaluation was performed in two stages. Firstly, chi-square test was applied between 'no smokers-regular smokers and occasional smokers' and other independent variables. Occasional smokers referred to those who smokes at least one cigarette in last 30 days, while regular smokers referred to those who smoke almost every day in the last 30 days (14).

The variables -monthly income, the amount of cigarettes consumed per day, and the duration of the smoking- which were found significant were analyzed by Spearman's Correlation Test. In the second phase; occasional smokers and regular smokers were categorized together as 'smokers'. Logistic regression were subjected for a further analysis between significant variables ($p < 0,05$) which were found after chi-square test result.

In the last phase of the study, the ratios of the participants' nicotine dependency levels were determined by the Fagerstrom Nicotine Dependency Test. Then, according to the dependency score results, chi-square analysis was performed between majors and grades variables.

RESULTS

A total of 255 students (82.5%) from three faculties participated in the study. Dental students regularly smoked the most and there was a significant difference between the smoking status and majors ($p < 0,05$). 47 (18.4%) male and 208 (81.6%) female students participated in the study. A statistically significant difference was found between the two groups. 189 students (74.1%) were from the first grade and 66 (25.9%) were from the last grade. There was no statistically significant result between grade and smoking status (Table-1).

The participants were asked to indicate 'the reasons of trying smoking' for the first time with 11 different reasons. The most emphasized reason of trying smoking was the 'curiosity' with the rate of 65.7%. The smokers were questioned for 'the reasons of smoking' with eight different factors, and the most emphasized causes were stated as 'to get pleasure (74.6%)', 'to reduce stress (43.3%)', 'to calm down (23.9%)', and 'friend effect (14.9%)'. The students were questioned about their smoking-related education during the faculty years. There was a significant difference between the groups in terms of grade and education status ($p < 0,05$) (Table-2). All of the participants were questioned about the relationship between smoking and illness, and the response rates are shown in Table-3.

Occasional smokers and regular smokers were categorized together as 'smokers'. Logistic regression were subjected for a further analysis between significant variables ($p < 0,05$) of smokers and nonsmokers which were found after chi-square test result.

The variables determined significantly after chi-square analysis were; major, grade, gender, mother-father social situation, father education, close friend's smoking habit, existence of another addiction.

Variables that were found significant in univariate analyzes, were analysed with the backward stepwise method of multivariate analysis and retain their significance (Table-4).

The dependency level ratios of the students are shown in Table-5. The levels of nicotine dependence was structured to be moderate (below 5 points) and above (5 points and above). Then, chi-square analysis was performed with the majors and grades variables according to the dependency score results. 52 students had moderate addiction (88.1%), and 7 students had above moderate addiction (11.9%). In the chi-square analysis of the students grade status, the first grade 'moderate dependency' ratio was 89.5%, 'the above moderate dependency' ratio was 10.5% In the last grade, 'moderate dependency' rate was determined as 85.8% and 'the above moderate dependency' rate as 11.9%. There was no significant difference between grade and dependency situations. In the chi-square analysis of the students majors according to their dependency status; 23 (44.2%) dentists, 13 (25.0%) pharmacy students, 16 (30.8%) nursing students were found with 'moderate dependence' and 6 (85.7%) dentistry and 1 (14.3%) nursing students were found with 'above moderate dependency'.

DISCUSSION

In the study, 255 (82.5%) were reached out of 309 students. Within these 255 participant; 33,7% were dentists, 24,7% were pharmacists and 41,6% were nursing students. Among the distributions according to smoking status, 16.1% ($n = 41$) were occasional smokers, 10.2% ($n = 26$) were regular smokers, and 73.7% ($n = 188$) were non-smokers. The total smoking rate was 26.3% that is total of occasional and regular smokers.

According to the results of different studies among university students in Turkey, the prevalence of smoking varies between 16% and 65% (15-17). It is stated in the literature that male gender is a risk factor for smoking (14,17). According to the CDC's "Global Adult Tobacco Survey"; the prevalence of smoking in males was found to be high in all countries where the study was conducted (14). According to WHO health statistics; males account for 80% of all smokers worldwide, and the rate of male smoking is 36% while rate of females is 8% (18). Smoking rates are found to be higher in males than in females, in our study (55.2% male, 19.7% female) and in other studies and that could be the effects of socioeconomic and cultural structure.

In our study, total smoking rates were 65.7% in first grade and 34.3% in last grade. In many studies, it has been observed that cigarette use increases with the increase of grade (19-21). In this study, it is thought that the decrease of cigarette use in the last grade may be due to more awareness and knowledge about the health risks of smoking and smoking cessation lessons in the last grade's education. In a study conducted at a university in Ethiopia in 2014, it was reported that the smoking rate decreased from the second year (8), and also according to the 'Canadian Tobacco Usage Report', the frequency of smoking in Canada decreased with age and education (22), and these studies support our findings.

In our study, it was noted that the stress factor was a common factor in attempting to smoke, continuing to smoke, increasing smoking desire and negatively affecting the desire to quit (23). It has been found in the researches; the cigarettes were used as a tool to cope with stress and sadness and the person tries to temporarily appease these feelings by applying to the cigarette during negative emotions such as tension and anger (24).

When controlling smoking, it is important to remove reminders. In this sense, especially for university students, studies should be carried out in order to improve compliance with the school, social activities and sports should be supported, ways of struggling with stress and responsibilities should be taught, students should be prevented from seeking different habits such as smoking and similar addiction (20,24). In our study, having a close friends who smokes was found to be 4.1 times the risk factor to smoke and In Dayi's study in 2013, this was found 2.77 times more (15). Many studies in the literature have indicated that friend influence is an important factor in cigarette use. These rates range from 30% to 87% (25-28).

Those who use different tobacco alternatives with cigarettes; they may perceive these products as less dangerous products used to reduce or quit smoking, or they may be seen as an alternative to cigarette smoking in areas where cigarette smoking is prohibited. These approaches, emerges today as a marketing techniques of the tobacco industry. In tobacco control it is important to follow the trends towards alternative tobacco products and reduce the accessibility of them by taking the necessary precautions and alert tobacco users and potential users about the health risks of these products (29,30).

CONCLUSION

The transition to university life creates a new cycle that affects tobacco initiation among young people. Health professionals have an important role to play in a tobacco-free life. This study showed that, giving health education about health effects and control of tobacco during faculty years, decreased smoking prevalence among students. Young people need to be carefully monitored and supported in order not to start smoking and to quit smoking. In this sense, tobacco use is more important for health professional students who are expected to struggle with smoking in the future.

From the first year of university education, further discussion of the causes of smoking and inclusion of theoretical and practical training about quitting smoking in curriculum will make an important contribution to the fight against smoking. University students should be further supported by social and sports activities, they should be prevented from aim of different habits such as smoking and the like. Following the trends of young people towards alternative tobacco products, the necessary precautions should be taken and the accessibility of these products should be reduced as much as possible. Students who want to quit smoking should be identified, and they should be directed to smoking cessation clinics and motivated in this regard. Students should be given practical skills in questioning and quitting tobacco use and should be taught tobacco control policies and the importance of these policies in terms of public health.

Acknowledgements

This work was supported by Scientific Research Projects Coordination Unit of Istanbul University with the project number BEK- 2017-26322.

TABLES

Table-1: Distribution of students' smoking status by majors, grades and gender

		Smoking Status								
Majors	No smoking		Occasionally		Regular		Total		Significancy	
	N	%	n	%	n	%	n	%		
Dentistry	53	61,6	20	23,2	13	15,1	86	100		
Pharmacy	50	79,4	8	12,7	5	7,9	63	100		
Nursing	85	80,2	13	12,3	8	7,5	106	100		
Total	188	73,7	41	16,1	26	10,2	255	100		
Male	21	44,7	13	27,6	13	27,6	47	100	X ² =28,634 P=0,000	
Female	167	80,3	28	13,5	13	6,2	208	100		
Total	188	73,7	41	16,1	26	10,2	255	100		
First Grade	145	77,1	27	65,9	17	65,4	189	74,1	X ² =3,381 P=0,184	
Last Grade	43	22,9	14	34,1	9	34,6	66	25,9		
Total	188	100	41	100	26	100	255	100		

		First Grade		Last Grade		Total		Significancy
		n	%	n	%	n	%	
Did you learn about smoking hazards in your courses?	Yes	38	20,1	58	87,9	96	37,6	X²=95,717 P=0,000
	No	151	79,9	8	12,1	159	62,4	
Did you discuss the reasons for smoking in your courses?	Yes	44	23,3	35	53,0	79	31,0	X²=20,248 P=0,000
	No	145	76,7	31	47	176	69,0	
Did you discuss the importance of getting a story from the patient about tobacco use?	Yes	71	37,6	58	87,9	129	50,6	X²=49,538 P=0,000
	No	118	62,4	8	12,1	126	49,4	
Have practical or theoretical training been given on quitting approaches?	Yes	15	7,9	31	47,0	46	18,0	X²=50,409 P=0,000
	No	174	92,1	35	53,0	209	82,0	
Has it been discussed that it is important to provide educational material that supports smoking cessation?	Yes	49	25,9	40	60,6	89	34,9	X²=25,895 P=0,000
	No	140	74,1	26	39,4	166	65,1	

Table-2: The distribution of smoking status according to having tobacco related education

Table-3: Distribution of cigarette - disease relationship information status according to grade

		First Grade		Last Grade		Total	
		n	%	n	%	n	%
Smoking- Disease Relationship	Lung Cancer	184	97,4	65	98,5	249	97,6
	Throat Cancer	136	72	52	78,8	188	73,7
	Oral Cancer	123	65,1	55	83,3	178	69,8
	Cardivascular Diseases	123	65,1	48	72,7	171	67,1
	Chronic Bronchitis	117	61,9	41	62,1	158	62,0
	Cerebrovascular Diseases	104	55,0	40	60,6	144	56,5
	Newborn Death	85	45,1	32	48,5	117	45,9
	Bladder Cancer	59	31,2	29	43,9	88	34,5

Table-4: The variables that found significance after logistic regression analysis

	B coefficient	Standart Error	Odds Ratio	% 95 CI	P
Another Addiction	2,264	,631	9,625	2,796-33,125	0,000
Close Friend Smoking Status	1,404	,396	4,070	1,872-8,849	0,000
Gender	1,179	,451	3,253	1,343-7,880	0,009
Grade	,929	,414	2,531	1,125-5,695	0,025

	Sayı	%
0-2: Very low dependence	42	71,3
3-4: Low dependence	10	17,0
5: Moderate dependence	1	1,7
6-7: High dependency	5	8,5
8-10: Very high dependency	1	1,7
Total	59	100

Table-5: Dependency distributions of smokers (n=59)

REFERENCES

- Asma S., et al. The GATS Atlas. *Atlanta, CDC Foundation* 2015; 40-41.
- Babatunde OA, Elegbede OE, Ayodele LM, Atoyebi OA, Ibirongbe DO, et al. Cigarette smoking practices and its determinants among university students in Southwest, Nigeria. *J Asian Sci Res* 2012; 2.2: 62.
- Carpenter C M, et al. Developing smokeless tobacco products for smokers: an examination of tobacco industry documents. *Tobacco Control* 2009; 18.1: 54-59.
- Chatkin J, Chatkin G. Learning about smoking during medical school: are we still missing opportunities? *Int J Tuberc Lung Dis* 2009; 13.4: 429-437.
- Dayı A. Cigarette, alcohol and substance use prevalence in Eskişehir Osmangazi University students. Master thesis. Eskişehir. 2013.
- Department of Health and Human Services* 2000; 00-0032.
- Disease Prevention and Health Promotion, Office on Smoking and Health 2014.
- Eticha T, Kidane F. The prevalence of and factors associated with current smoking among college of health sciences students, Mekelle University in Northern Ethiopia. *PLoS one* 2014; 9.10: e111033.
- Fiore M C., et al. Treating tobacco use and dependence: clinical practice guideline. *Rockville, MD: US*

- Göktalay T, et al. Cigarette smoking and factors affecting health education in 3rd and 4th grade students: Surveillance research. *Turkish Journal of Tuberculosis & Thorax- Tüberküloz ve Toraks Dergisi* 2011; 59.4.
- Güler M. Effects of tobacco and drift on adult cigarette addiction. Master Thesis. Hygiene Center Presidency, School of Public Health, Başkent University. Ankara, 2004. İstanbul. 2015.
- Kaptanoğlu YA, Polat G, Soyer M. Smoking habits and stable cost relations in Marmara University students and instructors, *Journal of Higher Education and Science* 2012; 2.2.
- Karahan F, Koc H. Examining the styles of coping with stress according to the frequency of alcohol and cigarette smoking among university students *Ege Eğitim Dergisi* Ege Journal of Education, 2005; 6.2.
- Kaya N, Çilli A S. 12 month prevalence of nicotine, alcohol and substance dependence in university students. *Journal of Dependence -Bağımlılık Dergisi* 2002; 3.2: 91-97.
- Kop B, Cuduz A, Kaspar Ç, Şencan N. Yeditepe University Faculty of Pharmacy students smoking habits: Qualitative and Quantitative Approach, *Marmara Pharmaceutical Journal* 2015; 19(1): 36-42.
- Molyneux A, et al. Is smoking a communicable disease? Effect of exposure to ever smokers in school tutor groups on the risk of incident smoking in the first year of secondary school. *Tobacco Control* 2002; 11.3: 241-245.
- National Burden of Disease and Cost Effectiveness Project. Burden of Disease. Final Report. Refik Saydam
- Parascandola M, et al. Consumer awareness and attitudes related to new potential reduced-exposure tobacco product brands. *Nicotine & Tobacco Research* 2009; 11.7: 886-895.
- Percival J, et al. International efforts in tobacco control. *Seminars in Oncology Nursing* 2003; Vol. 19. No. 4
- Reid JL, Hammond D, Burkhalter R, Ahmed R. Tobacco Use in Canada: Patterns and Trends, Waterloo, ON: Propel Centre for Population Health Impact, University of Waterloo 2012.
- Telli C, Solak Z, Özol D ve ark. Smoking habits of students starting university. *Solunum Dergisi-Respiratory Diseases Journal* , 2004; 6.3: 101-106.
- Tobacco Data Statistics. Fact Sheet. Centers for Disease Control and Prevention, National Center for Chronic
- Uysal MA, Kadakal F, Karşıdağ Ç, et al. Fagerstrom test for nicotine dependence: Reliability in a Turkish sample and factor analysis. *Turkish Journal of Tuberculosis & Thorax- Tüberküloz ve Toraks Dergisi* 2004; 52(2):115-21.
- WHO Tobacco Free Initiative. The role of health professionals in tobacco control. 2005.
- WHO. World Health Statistics 2012. Geneva: *World Health Press* 2012.
- World Health Organization. *Gender, Women, and the Tobacco Epidemic*. WHO 2010.
- World Health Organization. *Tobacco, Fact sheet*. 2016. Accessed in 28.10.2016, <http://www.who.int/mediacentre/factsheets/fs339/en/>
- World Health Organization. Global health risks: mortality and burden of disease attributable to selected major risks. World Health Organization 2009.
- World Health Organization. *WHO global report on trends in prevalence of tobacco smoking 2015*. World Health Organization 2015.
- World Health Organization. WHO report on the global tobacco epidemic, 2013: enforcing bans on tobacco advertising, promotion and sponsorship. World Health Organization, 2013.
- Yazıcı H, Ak İ. Depressive symptoms, personal health behaviors and smoking in university students. *Anatolian Journal of Psychiatry. Anadolu Psikiyatri Dergisi* 2008; 9:224-231.

E-FSDP: A Project-Based Development of a Decision Support System for Monitoring the Seminars and Training Programs of FAITH's Faculty and Staff

Alice M. LACORTE

First Asia Institute of Technology and Humanities Tanauan City, Batangas
amlacorte@firstasia.edu.ph

Jonathan M. CABALLERO

Technological Institute of the Philippines-Manila Philippines
jonathancaballero@yahoo.co.uk

ABSTRACT

This paper presents a research project which aims to design and develop an institutional electronic portfolio with analytics to forecast the most needed training programs of employees to further help improve their performance and productivity in the organization. The developed tool helps managers to effectively supervise and monitor the faculty and staff development programs (FSDPs) at First Asia Institute of Technology and Humanities (FAITH); its processes of managing centralized repository of data which is particularly helpful to those who are into accreditation processes where they are managing voluminous paper documents. Furthermore, this tool aid the users to create a baseline information regarding the defined development programs, monitor its percentage of accomplishments, submit requests for training online, compare budget allocation and evaluate the relevance of faculty and staff skills as needed in the job. The study followed the phases of the prototyping method to develop the system. To gain insights on the institution's processes of FSDPs, descriptive method of research was used. It made used of PHP, Bootstrap and MySQL as core technologies. Six major users were identified and these are: Academic Heads, Vice-President for Academic and Research, Human Resource Manager, Faculty and Staff and the Managing Director of the institution. Each of them has its own rights and privileges to access the system. Based on the results, the tool effectively helped managers to create the lists of its must-attend seminars and training needs in a year, monitor training needs of all employees, submit requests of seminars online, upload post-activity reports in a centralized repository and generate needed reports on demand-basis to be used for decision-making or strategic planning. The concept of the system can be applied not only in the faculty and staff development programs but can further be enhanced or customized to accommodate other areas or department handling document management processes.

INTRODUCTION

The next big thing considered in higher education computing is said to be the Electronic Portfolios (e-portfolios) [1]. Numerous universities and colleges have started coming up with their own e-portfolio systems for students, faculty and the institution itself. A portfolio is defined as a collection of work that a learner has collected, selected, organized, reflected upon and presented to show understanding and growth overtime [1]. It is used in schools to maintain records of academic performances produced from the teaching and learning activities that happened throughout the learning process of the students. This is to better support a deeper level of engagement and self-awareness in the part of the students [1].

Comparing the traditional portfolio to e-portfolio, the latter uses technologies such as CDs, DVDs and the Web. This allows students or faculty members to collect and organize portfolio artifacts in many types of media such as audio, video, graphics and text [1]. Furthermore, e-portfolio is a digitized collection of artifacts which includes demonstrations, resources and accomplishments that an individual, group or institution have achieved [2]. E-Portfolio is more than a simple collection, it can also serve as an administrative tool to manage and organize work created with different applications and to control who can see the work [2]. Being not just a simple collection, e-portfolio has three types such as student e-portfolios, teaching e-portfolios and institutional e-portfolios [2]. The highlight of this paper is on developing a tool for institutional e-portfolio which supports the institutional faculty and staff development programs specifically the monitoring and analysis of employees' training needs.

To develop the tool, a need to better understand the analytics part is vital. Analytics is a field of data analysis. It often involves studying past historical data to research potential trends, to analyze the effects of certain decisions or events, or to evaluate the performance of a given tool or scenario. Its goal is to improve the business by gaining knowledge which can be used to make improvements or changes [3]. In addition, it is a scientific process of transforming data into insight for making better decisions [4]. The analytics part in the system will incorporate the generation of reports from the e-portfolios that will help the academic heads forecast the needed training programs of faculty and staff to further help improve their performance and productivity of employees in the organization.

In relation to employee's productivity, it is important that employees in any organization must be equipped with the right knowledge and skills needed to perform their job. Training is responsible for building skilled, qualified and capable people, which helps organizations to improve their performance and adapt to any new change [5]. In higher educational institutions effective training or development programs depends on knowing what is required - for the individual, the department and the organization as a whole. Training Needs Analysis (TNA) enables organizations to channel resources into the areas where they will contribute the most to employee development, enhancing morale and organizational performance [5]. Effective TNA involves systematic planning, analysis and coordination across the organization, to ensure that organizational priorities are taken into account, that duplication of effort is avoided and economies of scale are achieved [5].

To contribute to the institution's goal of monitoring the employee's achievements and recognitions – making them available just-in-time" whenever needed by top management for strategic planning, institutional accreditations and training assessments, the utilization of current technologies and technology-driven processes play a major role in its realization.

These technologies can address major challenges faced by educational institutions with regards to management of these pertinent documents such as (1) slow and time-consuming processes in creating and submitting requirements for: Must-attend seminars (MAS), Training Needs (TN) and Off-campus seminar applications. These situation led to the rise of other concerns like difficulty in monitoring the submission of MAS and TN. Likewise, revisions are hard to be communicated in respective colleges, consolidation of data cannot be determined immediately as there is a need to wait for all the submissions before the final output can be generated, a need to perform manual calculations in the budget is required thus, cannot guarantee accurate results all the time, the office space had to be increased as more space was needed to store filing cabinets as the number of documents increased.

Another situation is that (2) minimal reports on accomplishments of MAS, TN and Off-campus Seminars/Training attended by Faculty and Staff were generated which resulted to: failure to accurately forecast budget demand and make comparative analysis, limited assessment and evaluation of the impact of the faculty and staff development programs of universities, unable to determine which trainings must be prioritized by the institution to make the faculty and staff more productive, ineffective and inefficient decision-making processes and lastly, (3) inability to monitor the percentage of accomplishment in relation to training needs and must-attend seminar. This is where the idea of the use of e-portfolios to support the day-to-day operations of the institutions in maintaining the records of its employee's achievements in relation to training and development programs ascended.

e-FSDP aims to monitor the faculty and staff development programs at First Asia Institute of Technology and Humanities (FAITH), its processes of managing centralized repository of data which is particularly helpful to those who are into accreditation processes where they are managing voluminous paper documents. Furthermore, this tool aid the users to create a baseline information regarding the defined development programs, monitor its percentage of accomplishments, submit requests for training online, compare budget allocation and evaluate the relevance of faculty and staff skills as needed in the job. The study followed the phases of the prototyping method to development the system. To gain insights on the institution's processes of faculty and staff development programs, descriptive method of research was used. It made use of PHP, Bootstrap and MySQL as core technologies.

There were six (6) main departments/units involved in the system. These are the Human Resource Department (HRD), Office of the President (Managing Director), Vice-President for Academics and Research (VPAR), Tertiary Schools' (TS) Academic Heads, Faculty and Staff. These departments/units will be working together to implement e-FSDP.

THE STUDY

The study utilized the prototyping method to develop the system. A prototype is a preliminary working model of a larger system [7]. Its initial stage begun with initial requirements phase where the descriptive method was performed through interview. This method was done to gain understanding on the processes involved in the monitoring of the faculty and staff development programs of FAITH particularly the seminars and trainings to be attended by its faculty and staff. Meetings and brainstorming with the project participants were also conducted to further solicit feedback on the various tasks to be integrated in the tool. After several interviews and meetings, the researchers were able to produce the system requirement report which contains the lists of requirements and proposed modules to be included in the system.

When the initial requirements were solicited, the initial design was created. This phase delivered to clients the design of the proposed graphical user interface through storyboards. From this phase, a prototype was developed to gain a clearer understanding of the user requirements. Prototype was presented to the users and they were allowed to enumerate their evaluation, comments and even suggestions [8]. These feedback were reviewed by the team if they were still valid and in the boundary and scope of the proposed system. A revision of the prototype was conducted and it then again be presented to the users incorporating the feedback and the additional requirements that are not yet presented. Until the customer evaluation becomes successful, review and updation continued [9]. Figure 1 depicts the Prototyping model phases.

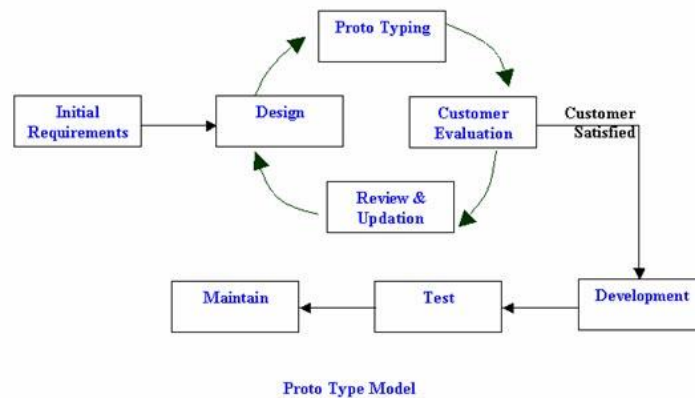


Figure 1: Prototyping Phases

FINDINGS

The developed system caters to six (6) main departments/units involved in the system namely: HRD, Managing Director, VPAR, Academic Heads (Dean and Chair), Faculty and Staff. Modules provided to major users are as follows: *Manage module* where the must-attend seminar and training needs are being created and the off-campus seminars are being requested. In this module also, the uploading of post-activity reports are being done. The *Track Module* where status of seminars/trainings attended are displayed. The *Report module* where the essential reports needed by a specific user can be generated. Figure 2 presents the architecture of the software:

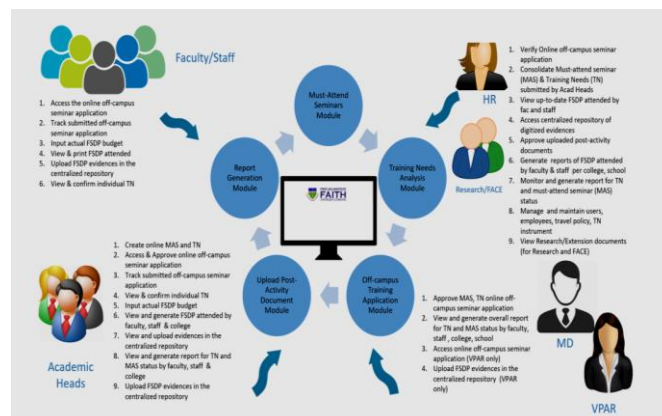


Figure 2: e-FSDP Software Architecture

The following are the modules included in the system. Reports generated by the system like TNA Summary, Comparative Analysis can be used by top level management to support the process of their decision making in relation to the continuous quality improvement of their faculty and staff development programs.

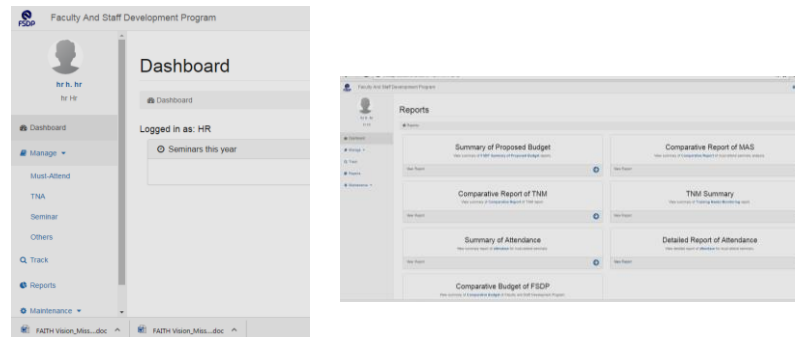


Figure 3: e-FSDP Sample User Interfaces

e-FSDP was able to perform the following functions:

1. **Forecast the most needed training programs of employees.** This function is available in the HR Account. This refers to the capability of the system to consolidate across all colleges all the training needs and rank it based on the number of employees who need the said training program.
2. **Monitor the faculty and staff development programs.** This functionality is available in the Chair Account. This pertains to the ability of the system to display the statuses of the must-attend seminars and training programs. The Program Chair is able to view the various seminars or training programs requested and approved by respective authorities.
3. **Manage centralized repository of data.** This function is available in the 5 major users namely: Faculty, Staff, Chair, Dean, Vice-President for Academics. This submodule is particularly helpful to those who are into accreditation processes where they are managing voluminous paper documents. This is the venue where the post-activity documents or reports are being uploaded and automatically submitted to the HR Manager. The HR Manager will be able to verify authenticity of such evidences online.
4. **Create a baseline information regarding the defined development programs.** In this sub-module, the creation of the list of must-attend seminars and training needs of the faculty and staff are being undertaken by the Chair. This is available in the Chair's account. The created file serves as the basis for all the seminars and training program which can be requested by faculty and staff. This is where the budget allocated for each seminar and training program are also being provided.
5. **Monitor FSDP's percentage of accomplishments.** This sub-module is available in all system users. The viewing of data or reports are based on the scope of the user's authority. Users are able to view the percentage of accomplishments of the seminars or trainings defined and attended by the employees. Accomplishments in this study refers to the number
6. **Submit requests for seminar or training online.** The major users of this module are the following: Faculty, Staff, Chair, Dean and VPAR. This is where these users are able to perform online the filing, submission and processing of requests for off-campus seminars or trainings. Approval stages are also captured in this module.
7. **Compare actual and proposed budget allocation.** This is the sub-module where the reports can easily be generated to determine comparative result of the actual and proposed budget pertaining to the must-attend seminars and training programs. Variances between the two values are also derived by the system.

CONCLUSIONS

Based on the results of the development and evaluation of the system or tool, the following statements were drawn: (1.) e-FSDP effectively aided in assisting academic heads to create the lists of its annual must-attend seminars, training needs and apply for off-campus seminar, thus forecasting the most needed employees' training programs; (2) e-FSDP enabled monitoring of the statuses and accomplishments of faculty and staff training programs; (3) e-FSDP provided a module for uploading of post-activity reports in a centralized repository thus, reports can be generated as the need arises as basis for decision-making or strategic planning. For future work, the concept of the system can be applied not only in the faculty and staff training needs analysis but can further be enhanced or customized to accommodate other areas such as student or teacher e-portfolios and other functional units of the organization which handles employees' pertinent documents used for assessments and decision making purposes.

REFERENCES

- Barett, Helen C. Using Electronic Portfolios for Classroom Assessment. Connected Newsletter, October 2006| Volume 13, No. 2, pp. 4-6. 2006
CareerRide.com. DOI = <http://www.careerride.com/pmp-strengths-of-prototype-model.aspx> DOI=<http://electronicportfolios.com/portfolios/ConnectedNewsletter-final.pdf>
Lorenzo, George, Ittelson, John, Oblinger, Diana. An Overview of e-Portfolios. 2005. DOI=<https://net.educause.edu/ir/library/pdf/eli3001.pdf>
Business Dictionary. DOI= <http://www.businessdictionary.com/definition/analytics.html>
Informs. DOI= <https://www.informs.org/About-INFORMS/What-is-Analytics>
Ghufli, Ali . “Training Needs Analysis: An empirical study of the Abu Dhabi Police”. Brunel Business School - Doctoral Symposium 27th & 28th March 2012. DOI=https://www.brunel.ac.uk/__data/assets/file/0008/180197/phdSimp2012AliGhufli.pdf
Chartered Management Institute. Training Needs Analysis. DOI=http://www.london.ac.uk/fileadmin/documents/staff/staff_development/tna.pdf
Satzinger, John W. Object-oriented Design and Analysis with the Unified Process. 2001. Cengage Learning Asia Pte. Ltd. Singapore
Prototyping in Systems Analysis and Design. DOI=http://www.umsl.edu/~sauterv/analysis/488_f01_papers/Hammer/term_paper_body.htm

Emotional and Social Intelligence Against Inertia

Okan ŞENELDİR

*Kocaeli Üniversitesi Kocaeli Meslek Yüksekokulu
seneldir@gmail.com*

Hüseyin SOYDAŞ

*Kocaeli Üniversitesi Kocaeli Meslek Yüksekokulu
huseyinsyds3@yahoo.com*

Yaşar GENEL

*Yüzüncü Yıl Üniversitesi Eğitim Fakültesi
yasargnl6@yahoo.com*

Üzeyir AKÇA

*Kocaeli Üniversitesi Kocaeli Meslek Yüksekokulu
uzeyirkc3@yahoo.com*

Mustafa KUDU

*Erzincan Üniversitesi Fen Edebiyat Fakültesi
mustafakd3@yahoo.com*

Sinan AYDIN

*Kocaeli Üniversitesi Kocaeli Meslek Yüksekokulu
sinanaydin1704@yahoo.com
Tel: +90 507 261 6572
Author*

ABSTRACT

Inertia means inaction. In other words, it means stasis, to be too lazy, not to move. Inertial behavior occurs as decrease in performance, procrastination, resistance to change, presenteeism, etc. Inertia also causes low performance, restlessness, reluctance, slowness and stress. Just as it is necessary to apply force to move an object, it is necessary to apply a kind of force to change people. Employees may not give themselves up to work due to distraction.

Emotional intelligence is the sense of one's own feelings and the feelings of other individuals. Emotional intelligence can provide a sense of emotions that lead to inertia. Because there are negative feelings like reluctance on the basis of inertia. Social intelligence is the part of intelligence that people use in relation to their social environment the concept of social intelligence and leadership have a positive relationship. Everyone can be a leader, but a privileged leader has high social intelligence. Leaders are the people who are farthest from inertia. As emotional and social intelligence increases, inertia diminishes.

INTRODUCTION

The notion of inertia or resistance to change has come up in many academic disciplines, including philosophy, sociology, psychology, political theory, economics and organizational studies. The term 'inertia' is often used to describe a kind of irrational resistance to change in individuals or institutions. Institutions, ideas and power structures appear to become entrenched over time, and may become ineffective or obsolete, even if they once played a legitimate or useful role.

When used in a social, political or psychological context, the term inertia is often used to describe a kind of irrational or counterproductive resistance to a change which is considered to be necessary, desirable or unavoidable. Resistance to change is not always irrational or problematic; it is also necessary to allow stable personal identities and social structures to survive in a constantly changing world.

‘Inertia’ and ‘resistance to change’ are sometimes used interchangeably. More often, inertia is used in a negative way, to mean a ‘bad’ kind of resistance to a desirable or necessary change, while resistance to change can also be neutral or even positive. According to Freud, there is an ‘inertia inherent in organic life’ : the human organism is inherently conservative and will only change when forced by external circumstances. This kind of inertia, however, is not limited to the individual or psychological level.

INERTIA CONCEPT IN PHYSICS

Inertia was best explained by Sir Isaac Newton in his first law of motion. Basically, the law of motion is that an object at rest stays at rest and an object continues in motion until an external force acts on it.”. The best place to test inertia is in Space. In outer space there is no air, or anything else to create friction. So moving objects will keep moving forever, and objects that aren't moving will stand still forever. Simple examples of moment of Inertia are the followings: If pulled quickly, a tablecloth can be removed from underneath of dishes. The dishes have the tendency to remain still as long as the friction from the movement of the tablecloth is not too great. If one drove a car directly into a brick wall, the car would stop because of the force exerted upon it by the wall. However, the driver requires a force to stop his body from moving, such as a seatbelt, otherwise inertia will cause his body to continue moving at the original speed until his body is acted upon by some force. When a car is abruptly accelerated, drivers and passengers may feel as though their bodies are moving backward. In reality, inertia is making the body want to stay in place as the car moves forward. Objects that establish orbit around the earth, like satellites, continue on their trajectory due to inertia. Inertia of rest is an object staying where it is placed and it will stay there until you or something else moves it.

INERTIA AS A BEHAVIOR TYPE

Inertia means inaction. The amount of inertia is resistance. In other words, it means stasis, to be too lazy, not to move. Inertial behavior occurs as decrease in performance, procrastination, resistance to change, presenteeism, etc. Inertia also causes low performance, restlessness, reluctance, slowness and stress. Just as it is necessary to apply force to move an object, it is necessary to apply a kind of force to change people. Employees may not give themselves up to work due to distraction.

Resistance is defined as a refusal to give in or to something that slows down or prevents something. The resistance is a response by the system, trying to maintain an implicit system goal. Overcoming change resistance has proven to be the crux of the sustainability problem. Typical reasons for resistance to change are followings:

- i. Poor communication: When it comes to change management there's no such thing as too much communication.
- ii. Changes to routines: When we talk about comfort zones we're really referring to routines. They make us secure. So, there's bound to be resistance whenever change requires us to do things differently.
- iii. Exhaustion: People who are overwhelmed by continuous change resign themselves to it.
- iv. Change in the status quo: Resistance can also stem from perceptions of the change that people hold. For example, people who feel they'll be worse off at the end of the change are unlikely to give it their full support. Similarly, if people believe the change favors another group/department/person there may be unspoken anger and resentment.
- v. Benefits and rewards: When the benefits and rewards for making the change are not seen as adequate for the trouble involved.

INTELLIGENCE

Intelligence is certainly one of the major constructs in management and other social sciences which is susceptible to rigorous analysis. Many scholars and leaders associate this construct with cognitive intelligence and they take it for granted that the Intelligence Quotient (IQ) is the measure for it. However, the literature on management shows that cognitive intelligence is inadequate to predict one's effective leadership or success throughout life (Judge et al, 2004). As a result of the inadequacy of cognitive intelligence in predicting a manager's success, scholars are now discussing other dimensions of intelligence: emotional intelligence, social intelligence or practical intelligence, and cultural intelligence (Rahim et al, 2015, 65).

WHAT IS EMOTIONAL INTELLIGENCE?

Goleman (1998) suggests that leaders in business organizations who are high on emotional intelligence display creativity in their decision making and performance. A study by Barczak, Lassk and Mulki (2010) found that emotional intelligence was indirectly related to creativity in teams. Emotional intelligence (EI) refers to a collection of skills such as self-control, determination, self-motivation and sensitivity to the feelings of others. Different scholars have defined and explained the concept of Emotional Intelligence in terms of models consisting of various emotional skills (Ranasinghe et al, 2017, 1). Gardner in his book "Frames of Mind" published in 1983 proposed that there was a wide spectrum of intelligences that was crucial for success in life. For example, interpersonal intelligence comprising of leadership, the ability to nurture relationships, the ability to resolve conflicts and the skills of social analysis, was one such intelligence described by Gardner. Yale University psychologist Peter Salovey defined Emotional Intelligence in 5 domains, namely, knowing one's emotions, managing emotions, motivating oneself, recognizing emotions in others and handling relationships. This new dimension of intelligence has received much attention as being more responsible for professional success than the Intelligence Quotient (IQ), the traditionally used measure of intelligence. Emotional Intelligence involves skills such as motivation and determination, which plays an important role in achieving goals. A review by Mayer, et al found that higher Emotional Intelligence is correlated positively with, better social relationships in children and adults, higher academic achievement, better relationships during work performance and enhanced psychological well-being.

Environmental and environment-related behavior is closely associated with affective characteristics of individuals. To create environmental awareness, students should empathize with creatures and their habitat. Empathy is associated with the concept of emotional intelligence (Ercan et al, 2017, 80). According to Zayapragassarazan and Kumar (2011) Intelligence Quotient (IQ) is inadequate to evaluate someone, since people are academically brilliant but socially and interpersonally not appropriate. In their study, they mention that only IQ is not enough for professional success of medical professions. Professionals may be competent, but without social skills they are less successful. According to Mayer and Salovey (1995), Emotional Intelligence is the capacity to process emotional information accurately and efficiently and EI effects the person's relationship with the other people. Behnke and Greenan (2011) summarize Emotional Intelligence as one's ability of using learnt information in different situations, coping with different problems and abstract thinking.

The superior coping among emotionally intelligent athletes may be explained by their tendency to appraise events as challenges rather than threats, perceive greater control over the stressors they experience, and control their emotions better. Based on the link between EI and coping, some researchers have categorized trait EI within the broader ambit of the coping process.

Although the majority of research supports Emotional Intelligence theory, criticism rises generally from the social sciences. Theorists maintain that Emotional Intelligence has no objective quantity on which it can be based. On the other hand, evidence from the neurological sciences suggests that social and emotional intelligence is not only supported by research but also has a physiological basis. Social and emotional intelligence can be observed and measured using neuroimaging (Sigmar et al., 2012, 304).

SOCIAL INTELLIGENCE

Social intelligence first used by Sorendike for description of person's act and behavior. It means as skill to percept of others and intelligent behavior in relation with other people. The social intelligence is a comprehensive term that it includes the large collection of inner/ interpersonal behaviors. It concludes of components of social information processing, social knowledge and social skills (Saffarinia, 2015, 229). Social intelligence (SI) is different from emotional and cultural intelligence, but there are some overlaps among these constructs. Scholars generally agree that social intelligence is the ability to interact with the environment effectively to be successful in life or in an organization. Generally, social intelligence is considered as a different construct from cognitive intelligence.

Social Intelligence consists of four categories of abilities: Situational awareness, situational response, cognitive empathy, and social skills. Situational awareness refers to one's ability to collect information for the diagnosis and formulation of problems and situational response refers to one's ability to use this information to make effective decisions to obtain desired results. The other two abilities, cognitive empathy and social skills, refer to the abilities to understand the feelings and needs of people, to communicate with them effectively, and to build and maintain relationships (Rahim et al. 2015).

Situational Awareness is associated with one's competence or ability to comprehend or assess relevant social situational contexts. This ability enables them to formulate a problem correctly. Situational Awareness component should include, among others, the abilities to: 1. Formulate a problem correctly. 2. Read a complex situation quickly. 3. Understand the risks and gains present in a social situation. 4. Determine the root causes of a social problem. 5. Make realistic assessments of situations. 6. Understand the real issues involved in a situation.

Situational response is associated with one's competence or ability to adapt to or deal with any social situation effectively. This is essentially the decision-making competence of leaders, described by Bennis and Thomas (2002) as 'adaptive capacity'. Situational response component should include the abilities to: 1. Adapt appropriately to different situations. 2. Respond to a crisis situation effectively. 3. Know how to adapt to a new work environment. 4. Make a decision that will lead to problem solving. 5. Make quick decisions to deal with routine matters.

Empathy refers to one's ability to understand others and take active interest in them, recognizing and responding to changes in their emotional states and understanding their feelings. Several components of empathy are cognitive, intellectual, affective and behavioral. Cognitive empathy is associated with one's ability to recognize the thinking, feelings, intentions, moods and impulses of people inside and outside the organization and is a component of SI. Kaukiainen et al. (1999, 83) suggest that 'the cognitive component of empathy forms an essential part of social intelligence'. This component should include the abilities to: 1. Know how an individual is feeling. 2. Know what an individual is thinking. 3. Understand the moods of people. 4. Understand people's feelings transmitted through nonverbal messages. 5. Know when people disguise their true feelings.

Most of the definitions of SI include social skills which is associated with one's ability or competence to speak in a clear and convincing manner that involves knowing what to say, when to say it and how to say it. Social skills also involve building and maintaining positive relationships, to act properly in human relations, to deal with problems without demeaning those who work with him or her, and to negotiate and manage conflict with tact and diplomacy. This component should include the abilities to: 1. Be comfortable among different people. 2. Manage with equal ability men, women and children. 3. Interact appropriately with a variety of people. 4. Negotiate well to reach an agreement. 5. Build and maintain positive relationships.

OPEN SYSTEM AGAINST INERTIA

Knowledge has been identified as an important factor in all fields of discipline. Organizations are often considered as living systems. These living systems are vulnerable to pathogens as humans. Organization might be quite ill and its condition may be pathological (Beer and Spector, 1994). Organizations do not exist by themselves in a vacuum; they are a part of an interactive and dynamic environment (Hassin, 2010). Today, organizations have become open systems due to the impact of the external environment in which they are functioning. The significance of any organization is to understand the environment in which it operates and respond effectively to attain its mission (Hawkins, 2011). Organizational diagnosis, which applies behavioral science to Knowledge Management Practices (KMP), supports organizations to make any changes to be more effective and competitive in the business operations (Sivakumar, 2017).

CONCLUSION

Emotional intelligence is the sense of one's own feelings and the feelings of other individuals. Emotional intelligence can provide a sense of emotions that lead to inertia. Because there are negative feelings like reluctance on the basis of inertia. Social intelligence is the part of intelligence that people use in relation to their social environment. The concept of social intelligence and leadership have a positive relationship. Everyone can be a leader, but a privileged leader has high social intelligence. Leaders are the people who are farthest from inertia. As emotional and social intelligence increases, inertia diminishes.

REFERENCES

- Barczak, G., Lassk, F. & Mulki, J. (2010). Antecedents of Team Creativity: An Examination of Team Emotional Intelligence, Team Trust and Collaborative Culture. *Creativity and Innovation Management*, 19, 332–45.
- Beer, M. & Spector, J. (1994). Organizational Diagnosis: It's Role in Organizational Learning. *Journal of Counselling & Development*, 71(6), 642-650.
- Behnke, C. & Greenan, J. P. (2011). The Relationship Between Emotional Intelligence and Attitudes Toward Computer-Based Instruction of Postsecondary Hospitality Students. *Journal of Career and Technical Education*, 26(1), 62-84.
- Bennis, W.G. & Thomas, R.J. (2002). *Geeks and Geezers*. Harvard Business School Press, Cambridge, Ma.
- Ercan, O. Ural, E. Köse, S. (2017). The Effect of Web Assisted Learning with Emotional Intelligence Content on Students' Information About Energy Saving, Attitudes Towards Environment and Emotional Intelligence. *Science Education International*, 28(1), 78-94.
- Gardner H. (1999). *Frames of Mind: The Theory of Multiple Intelligences*. New York: Basic Books.
- Goleman, D. (1995). *Emotional Intelligence*. New York: Bentham Books.
- Cowden, R. G., (2016). Mental Toughness, Emotional Intelligence, And Coping Effectiveness: An Analysis of Construct Interrelatedness Among High-Performing Adolescent Male Athletes.
- Hassin, A. (2010). Effective Diagnosis in Organization Change Management. Australia, *Journal of Business Systems, Governance and Ethics*, 5(2), 23.
- Hawkins, F. (2011). Organizational Change: Diagnosing. *Progress in Neurobiology*, 95(4), 629-635.
- Judge, T. A., Colbert, A. E., & Ilies, R. (2004). Intelligence and Leadership: A Quantitative Review and Test Of Theoretical Propositions. *Journal of Applied Psychology*, 89, 542–552.
- KAUKIAINEN, A., BJORKQVIST, K., LAGERSPETZ, K., OSTERMAN, K, SALMIVALLI, C., ROTHBERG, S. and AHLBOM, A. (1999). The Relationships between Social Intelligence, Empathy, and Three Types of Aggression. *Aggressive Behavior*, 25, 81–9.
- MAYER, J. D. ROBERTS, R. D. BARSAD, S. G. 2008. Human Abilities: Emotional Intelligence. *Annu Rev Psychology*, 59, 507–536.
- MAYER, J. D. & SALOVEY, P. (1995). Emotional intelligence and the construction and regulation of feelings. *Applied and Preventive Psychology*, 4, 197-208.
- RAHIM, M. A. (2014). A Structural Equations Model of Leaders' Social Intelligence and Creative Performance. *Creativity and Innovation Management*, 23(1), 44-56.
- RAHIM, M. A. CIVELEK, I. Feng Helen LIANG, F. H. (2015). A model of department chairs' social intelligence and faculty members' turnover intention. *Intelligence*, 53, 65–71.

- RANASINGHE, P. WATHURAPATHA, W. S. MATHANGASINGHE, Y. & PONNAMPERUMA, G. (2017). Emotional intelligence, perceived stress and academic performance of Sri Lankan medical undergraduates. *BMC Medical Education*, 17(41).
- SAFFARINIA, M. & ABBASPOUR, P. & DEHESTANI, M. (2015). Comparison of social intelligence and prosocial personality in medical students with and without internet addiction. *Journal of Fundamentals of Mental Health* 2015 Sep-Oct, 17(5), 229-33.
- SALOVEY, P. GREWAL, D. (2005). The science of emotional intelligence. *Curr Dir Psychol Sci.* 14, 281–285.
- SIGMAR, L. S. HYNES, G. E. & HILL, K. L. (2012). Strategies for Teaching Social and Emotional Intelligence in Business Communication. *Business Communication Quarterly*, 75(3), 301–317.
- SIVAKUMAR, K. & S A LOURTHURAJ, S. A. 2017. An Integrative View of Organizational Diagnosis, Emotional Intelligence, Organizational Learning and Knowledge Management Practices: Impact on KMP. *The IUP Journal of Knowledge Management*, 15(2), 19-42.
- ZAYAPRAGASSARAZAN, Z. & KUMAR, S. (2011). Emotional intelligence and medical professionalism. *Bulletin of National Teacher Training Centre*, 18(2), 3-4.

English Language Teaching in Ecuador: An Analysis of its Evolution within the National Curriculum of Public Primary Schools

Sandy T. SOTO

*ELT Innovators Research Group
Universidad Técnica de Machala, Ecuador
<http://orcid.org/0000-0003-2314-654X>
stsoto@utmachala.edu.ec*

Eder INTRIAGO

*ELT Innovators Research Group
Universidad Laica Eloy Alfaro de Manabí, Ecuador
eder.intriago@gmail.com*

Estefanía VARGAS CAICEDO

*ELT Innovators Research Group
Universidad de Guayaquil, Ecuador
vargasnestefania@gmail.com*

Maricela CAJAMARCA ILLESCAS

*ELT Innovators Research Group
Universidad Nacional de Educación – UNAE, Ecuador
cajamarcam1@gmail.com*

Silvia CARDENAS

*Colegio Río Upano, Ecuador
silvyelizabethcs@hotmail.com*

Paolo FABRE MERCHAN

*ELT Innovators Research Group
Universidad Estatal de Milagro, Ecuador
mrpipe23@gmail.com*

Israel BRAVO

*Universidad de Guayaquil, Ecuador
bravo.israelgt@gmail.com*

María Antonieta MORALES

*Universidad de Guayaquil, Ecuador
antonieta.moralesj@ug.edu.ec*

Jhonny VILLAFUERTE

*Universidad Laica Eloy Alfaro de Manabí, Ecuador
University of the Basque Country, Spain
Fellow of Senescyt, Ecuador
jhonny.villafuerte@gmail.com*

ABSTRACT

This study aims at portraying the gradual change in the status of the English as a Foreign Language (EFL) subject within the Ecuadorian National Curriculum for public primary schools since it was introduced in the curriculum in 2000. For the achievement of this purpose, we performed a review of public documents including Ministry of Education agreements, studies performed by UNESCO as well as data from official webpages, and newspapers. The results showed that the introduction of the EFL subject in the curriculum of public primary schools in 2000 resulted from the attempts made by the administrators of the CRADLE project since 1993. In 2000, English was introduced as an elective subject. It could only be taught in the establishments that had the facilities and specialized human resources. School principals had the say whether to incorporate EFL, Music, or Manual Arts in the periods assigned for the elective subject. In 2011, the status of the subject changed to as complementary activities. EFL and Computing were the choices this time. In March 2014, the complementary activities were excluded from the primary school curriculum, generating a huge controversy around Ecuador. Consequently, the Ministry of Education claimed that EFL would be included again in the primary schools' curriculum after having the curriculum for this subject and prepared human resources ready. EFL was officially implemented as a compulsory subject in all Ecuadorian public primary schools in September 2016 in the *Sierra* and Amazon region; and in 2017, in the coastal provinces. Space is left to study whether this subject is being incorporated in all schools or not.

Keywords: EFL, Public primary schools, Ecuador, Curriculum

INTRODUCTION

English as a Foreign Language (EFL) teaching in Ecuador has undergone several processes and reforms that in most cases benefited only secondary schools. In 1992, the launch of the Curriculum Reform Aimed at the Development of the Learning of the English (CRADLE) project drove the incorporation of EFL in the curriculum for the secondary level starting in 1993 (The CRADLE Project, Ecuador, n.d.). Unfortunately, this was not the case for public primary schools- grades 1st to 7th. Before 2016, EFL teaching in public primary schools was not a priority. Economic, social, political, and educational forces (Soto, 2014) influenced how EFL would be considered in that academic level. Despite of this, many attempts were made to introduce the subject into the curriculum of primary schools. Such efforts led stakeholders to issue agreements that would address the introduction of EFL in the curriculum under different denominations/statuses.

EFL has passed from being an elective subject, as it was first introduced in 2000, to become a complementary activity later on. In both cases, it was not compulsory. However, such condition would change with the election of a new political leader in 2006. The progressive philosophy of Rafael Correa made of education one of the fundamental pillars of his government. He put a lot of emphasis on bringing the nation up to international standards, which included seeing English learning with different eyes. Proficiency and Assessment requirements, training for EFL teachers, the design of a new curriculum, the establishment of learning and teaching standards, among other things, would occur after a language proficiency evaluation administered to both students and teachers in 2009. All of this would once again target the secondary level forthwith. But, something had to be done for the primary school as well, considering that those years are critical for language learning.

Finally, EFL would be officially implemented as a compulsory subject in all Ecuadorian public primary schools in September 2016 in the *Sierra* and Amazon regions and in 2017 in the coastal region. Before that happened, a gap of about three years would emerge in the teaching of this language, though. The irregular way in which EFL had been taught in primary schools due to the lack of a curriculum, standards, alignments, qualified teachers to instruct the language at this level, among other considerations, led the stakeholders in turn to suspend the teaching of EFL in primary schools since 2014 up part of 2016. Such decision caused controversy nationwide because during that time no room was left for EFL, not even as an elective nor complementary activity. Uncertainty became part of the day to day also as the future of EFL teaching in elementary schools was not clear due to the shortage of qualified EFL teachers in Ecuador.

Considering the importance of documenting events that mark the advance of education in each nation worldwide, this study aims at portraying the gradual change in the status of the EFL subject within the Ecuadorian National Curriculum for public primary schools since it was introduced in the curriculum in 2000. To accomplish this objective, this work includes all the curricular frameworks approved for primary schools since 1996. A descriptive analysis of how EFL was acknowledged in each curricular framework complements the chronological portrayal of EFL in Ecuadorian primary schools.

METHODOLOGY

This study required a deep analysis of the historical background of English language teaching in primary schools taking into account how it was labeled in the curricular frameworks approved for this level over the years. Therefore, qualitative data such as official documentation and posts on government websites that helped in the understanding of the changes in the status of EFL teaching in Ecuadorian primary schools were analyzed. Agreements 00001504; 306-11; 0041-14; and 0052-14 were key in this study as they reported reforms and regulations for EFL teaching in primary schools. Reports published by UNESCO were also crucial as they provided information about the curricular framework of Latin American countries, including Ecuador. The data collection and analysis were carried out from January 2016 to May 2017.

FINDINGS

The efforts for introducing EFL as a formal subject in the secondary started in 1992-1993 with the implementation of CRADLE, and later on with Advance (the EFL teaching project that replaced CRADLE in 2012). This, however, was not the case for EFL in primary schools. In the past, there was not much support from education stakeholders to include English in public primary schools. In fact, as shown in the curriculum approved in 1996, see Table 1, it did not exist for the kindergarten, basic elementary, or basic intermediate levels of primary schools (UNESCO, 2010/11).

Table 1.
Curriculum Approved for Basic Elementary Levels

Subject	Weekly periods per grade					
	I	II	III	IV	V	VI
Spanish	8	8	7	7	5	5
Math	5	5	6	6	7	7
Social Sciences	3	3	4	4	5	5
Science	2	2	3	3	4	4
Sub-total	10	10	8	8	8	8
Technical-Practical Formation						
Physical Education	3	3	2	2	2	2
Artistic Education	4	4	3	3	3	3
Practical Activities	3	3	3	3	3	3
Subtotal	10	10	8	8	8	8

Complementary Activities						
Class Association	2	2	2	2	2	2
Total	30	30	30	30	30	30

Source: UNESCO, 2010/11. Agreement 1443, April 1996

Adapted by the authors

However, efforts of citizens and CRADLE administrators started to gain strength years later. With the aim of improving EFL learning in Ecuador, the CRADLE project proposed to the Ministry of Education at that time to include EFL in the curriculum for primary public schools and seven years after they started operating with the project at the high school level, they managed that the Ministry of Culture and Education included EFL in primary schools (Caizaluisa, 2011; L. Arevalo, personal communication, February 11, 2016; J. Chamba, personal communication, January 10, 2016). Consequently, in March 2000, the Ministry of Culture and Education issued Agreement 00001504 (Ministerio de Educación y Cultura, 2000). According to the Article 2 of this agreement, the Ministry of Culture and Education agreed to include EFL instruction from the first to seventh years of primary school as an elective subject in the institutions that had the facilities and staff with the qualifications to teach the language.

As it was stated in Agreement 00001504, room was made for incorporating EFL in the curriculum of public primary schools as an elective subject. However, the academic hours assigned for the elective were not exclusive for the teaching of EFL. According to the Ministerio de Educación (2011), the school principals had the say to include either EFL, Music, or Manual Arts as an elective. As a guide for EFL teachers of primary schools that included English in their curriculum, in 2007, CRADLE presented, through the Foreign Language Administration, the EFL Program for grades one to seven of EGB: Curriculum design by competences: Philosophy, foundation, and guidelines for the teaching of elective EFL in grades 1st. to 7th (Ministerio de Educación, Dirección Nacional de Currículo, & División de Idiomas Extranjeros, 2007). This program was noncompulsory, therefore, not all public primary school teachers adhered to it.

The possibility of having EFL as an elective the curriculum for primary schools was mandated in Agreement 00001504, but the national curricular framework of primary schools was not modified immediately. Schools principals did attached to what was ordered in Agreement 00001504, though. In December 2009, the Ministry of Education launched a new curricular framework for primary schools, see Table 2, and in its structure is seen the incorporation of the aforementioned elective subject (UNESCO, 2010/2011).

Table 2.

Primary Education: Weekly Schedule per curricular area

Area	Weekly periods per grade					
	First cycle		Second cycle		Third cycle	
	1st	2nd	3rd	4th	5th	6th
Spanish and Literature	12	12	10	10	8	8
Math	6	6	6	6	6	6
Social and Natural Environment	5	5	-	-	-	-

Science	-	-	4	4	4	4
Social Studies	-	-	4	4	5	5
Esthetics	3	3	3	3	3	3
Physical Education	2	2	2	2	2	2
Elective	2	2	1	1	2	2
Weekly total	30	30	30	30	30	30

Source: UNESCO, 2010/2011. Agreement 61199, December 6, 2009.

Adapted by the authors.

Another change that involved EFL teaching in primary schools was seen in August 2011 with the issue of Agreement 306-11 (Ministerio de Educación, 2011a). Through this agreement, the Ministry of Education assigned five class periods for complementary or additional activities, which replaced the two class periods appointed to the elective subject in primary schools. The extra periods of complementary activities added five more class periods to the school workload, which translated into an official transformation of the school workload from 30 to 35 hours. As complementary activities, teachers could, among other subjects, instruct students in EFL and Computer Use (see Table 3). However, in order to incorporate these subjects (special subjects as they were named), public primary schools were required to have qualified staff and resources to teach the mentioned subjects.

Table 3

Approved workload for basic general education.

Subject	EGB Grades									
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th
Spanish and Literature	-	12	12	9	9	8	8	6	6	6
Math	-	6	6	6	6	6	6	6	6	6
Social and Natural Environment	-	5	5	-	-	-	-	-	-	-
Science	-	-	-	4	4	4	4	4	4	4
Social Studies	-	-	-	4	4	5	5	5	5	5
Esthetics	-	3	3	3	3	3	3	3	3	3
Physical Education	-	2	2	2	2	2	2	2	2	2
Elective	-	-	-	-	-	-	-	5	5	5
Subtotal	-	30	30	30	30	30	30	30	30	30
Additional Activities*	-	5	5	5	5	5	5	-	-	-

Total	35	35	35	35	35	3	35	35	35	35
						5				

Adapted by the authors. Source: Agreement 306-11 of August 2011.

* Additional activities included EFL, Computer Use, Music or Physical Education

As can be noticed, in the agreements issued between 2000 and 2011 EFL was only considered officially as an elective subject within the curriculum of public primary schools; no mandatory curriculum existed for this subject at the primary level; and, school authorities were the ones who decided whether to include English in their schools or not based on the available resources at their disposal. 2014 marked another important point of reference for EFL teaching in primary schools in Ecuador. A new agreement was issued in that year which generated polemic nationwide.

A controversial agreement

Agreement 0041-14 issued on March 11, 2014 caused national controversy as it established a new curricular framework for EGB which did not leave room for EFL teaching in primary schools (see Table 4). The academic hours assigned for complementary activities, in which English could be taught, were excluded from second to seventh grade in this curricular framework. In their place, academic hours for *Clubs* were included. As it was contemplated on this curricular framework, *Clubs* were meant for extracurricular activities concerning cultural-artistic, sporting, scientific, and social interaction matters (Ministerio de Educación, 2014a). The school community and the media reacted immediately and claimed that this new agreement represented a setback for the public primary education.

Table 4
School workload for the ten years of EGB

Core Subjects and Clubs	Grades of EGB / Hours per week									
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th
Language Literature	25	12	12	9	9	9	9	6	6	6
Mathematics	-	8	8	7	7	7	7	6	6	6
Natural and Social Environment	-	5	5	-	-	-	-	-	-	-
Natural Science	-	-	-	5	5	5	5	4	4	4
Social Studies	-	-	-	4	4	4	4	4	4	4
Aesthetic Education	2	2	2	2	2	2	2	2	2	2
Physical Education	5	5	5	5	5	5	5	5	5	5
English as a foreign language	-	-	-	-	-	-	-	5	5	5
Clubs	3	3	3	3	3	3	3	3	3	3

Source: Agreement 0041-14 issued on March 11, 2014.

Translated by the authors

In light of this, on March 23rd, 2014, the Ministry of Education issued a communication on its official website and stated that what had been reported by the media was weak and that such agreement did not modify the curricular framework for public primary schools (Ministerio de Educación, 2014c). In addition to that, the Ministry of Education also indicated that

those institutions that already offered EFL or any other foreign language within their curriculum, in the first grades of EGB, could continue offering its instruction by presenting the curriculum to the corresponding District Administration following the transitory disposition stipulated in the mentioned agreement (par. 3).

However, the point was that this transitory disposition stated that only once the Ministry of Education had published the curriculum for EFL, had the textbooks and the necessary human resources to teach this subject in the first years of GBE, the current curriculum and the class workload could be modified to incorporate EFL as an individual subject (Ministerio de Educación, 2014a). This meant that schools had to wait until the Ministry of Education and the Foreign Language Administration were ready to implement this subject in the curriculum of public primary schools.

The day after the aforementioned communication was published on the Ministry of Education's website, a new agreement was issued by the Ministry of Education, Agreement 0052-14. Through this agreement, the Ministry of Education agreed to issue the "Regulations Exploitation of the Transitory Disposition Included in the Agreement which stated that English language teaching would be mandatory for public, religion-driven, and private institutions from the second grade of primary school to the last year of high school (Ministerio de Educación, 2014b). This reform would be included in the 2016-2017 school year for the *Sierra* and amazon regions and in 2017-2018 for the coast (Ministerio de Educación, 2014d) -Dates vary because the beginning of the school year in Ecuador is not the same for all regions in the country. Classes begin in April-May in the coastal provinces and the Galápagos Islands and in September in the *Sierra* and Amazon regions.

Likewise, in its Article 2, Agreement 0052-14 also stipulated that the academic periods, which in Agreement 041-14 were assigned to *Clubs*, could be used for EFL classes. Additionally, in its article 3, the agreement also specified that "for schools to be able to incorporate EFL in their curriculum, they needed to have teachers accredited with a CEFR B2 level; the school should also have the necessary resources to guarantee the correct learning of this language" (Ministerio de Educación, 2014b, p. 3). The deficit of English teachers with a B2 level was evident, meaning that several schools that wanted to implement English in their curriculum were not able to fulfill this requirement. In one of its articles, *el Comercio* (2014, March 26) highlighted this situation; and, since English was not compulsory for the primary grades, the schools that did not have teachers for the job could opt for the other alternatives offered through *Clubs*.

Principals of public primary schools, concerned with continuing to provide EFL instruction, appealed to their districts administrators to assign an English teacher to their institutions, but as there were very few teachers with a CEFR B2 level to work in primary schools so this requirement could not be fulfilled. The state of EFL instruction in public institutions varied between public primary schools that excluded the subject to adhere to the new curricular framework and those schools that continued with it. Being the former case the most commonly found due to the lack of competent EFL instructors available (*El Comercio*, 2014, March 26).

EFL finally became a core subject in primary schools

After all the ups and downs, on February 17th, 2016, the Ministry of Education issued the agreement that would give EFL a life of its own in primary schools. EFL would not be treated as an elective or complementary activity anymore. Agreement *MINEDUC-ME-2016-00020-A* finally incorporated EFL as a core subject in the curriculum of primary schools (Ministerio de Educación, 2016a). With a new curricular framework (see Table 5), Agreement *MINEDUC-ME-2016-00020-A* restated what the Ministry of Education had indicated in Agreement 0052-14. English language teaching became compulsory for public, religion-driven, and private institutions from the second grade of primary school to the last year of high school in the 2016-2017 school year of the *Sierra* regime and in the 2017-2018 school year of the coast regime. It would be incorporated progressively, though, until all primary schools have the staff with qualifications to teach English.

Table 5

School workload for the ten years of EGB

Subjects	Grades of EGB / Hours per week								
	Basic elemental			Basic Intermediate			Upper Basic		
	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th
Language and Literature	10	10	10	8	8	8	6	6	6
Mathematics	8	8	8	7	7	7	6	6	6
Social Studies	2	2	2	3	3	3	4	4	4
Natural Science	3	3	3	5	5	5	4	4	4
Cultural and artistic education	2	2	2	2	2	2	2	2	2
Physical Education	5	5	5	5	5	5	5	5	5
English as a foreign language	3	3	3	3	3	3	5	5	5
School projects	2	2	2	2	2	2	3	3	3

Source: Agreement *MINEDUC-ME-2016-00020-A* issued on February 17th, 2016.

Translated by the authors

By the time EFL was allocated as a core subject in the curriculum of primary schools, the curriculum and textbooks for this subject were ready; just like the Ministry of Education had reported in Agreement 0052-14. The requirement of counting with staff accredited with a CEFR B2 level would be met through the “It is time to teach in Ecuador project”. This project has recruited (since 2016 up to date) volunteer professionals who hold a B2 accreditation to teach in public schools of Ecuador (Ministerio de Educación, 2016b). It is time to teach in Ecuador project will be open until accomplishing the goal of counting with qualified staff to teach EFL in all schools belonging to both the primary and secondary level.

As it has been discussed throughout this work, the EFL has been part of the curriculum of primary schools for almost two decades. It did not hold a place of its own for thirteen years; during those years, it was taught as an elective or complementary activity. An interval of about three years without EFL in primary schools occurred prior to earning a spot in the Ecuadorian curriculum. However, the shortage of teachers with the qualifications to teach this language is still a barrier that need to be overcome. Hopefully, projects like "It is time to teach in Ecuador" will aid to cover the demand of EFL teachers for primary schools and soon children all over Ecuador will have the opportunity to learn this language.

CONCLUSIONS

The purpose of this work was to portray the gradual change in the status of EFL within the Ecuadorian National Curriculum for public primary schools. In light of this objective and the results found, we can conclude that EFL has existed (under different labels) in the curricular framework of primary schools in Ecuador for almost two decades. Since 2000 up to 2013, two agreements allowed for its delivery as an elective subject first and then as a complementary activity, which permitted some schools, teachers and students to benefit from it. Of course, the quality, extent and depth of the program depended on factors such as the will of the principal and availability of resources and teachers. Regardless of this reality, some primary schools did offer EFL to their children.

President Rafael Correa, who governed Ecuador since 2007 up to 2017, was not satisfied with the irregular way EFL was delivered in primary schools. It was noncompulsory, there was not curriculum for this level, no books, no teachers with appropriate qualifications, no guidelines, nothing. It meant that not all children would be benefited from learning EFL. It also meant that what children enrolled in one primary school learned was completely different to what was learned by children enrolled in other primary school, no matter if both schools were located in the same city or neighborhood. Therefore, in 2014 the Ministry of Education banned primary schools from teaching EFL unless they had teachers with qualifications to do it. At the same time, The Ministry of Education also communicated that EFL would be part of the curriculum of primary schools in 2016 again, but this time a curriculum, books, and qualified teachers would frame its delivery. A gap of about three years arose in the teaching of EFL in primary schools before it finally became part of their curriculum with the status of EFL itself and not under the label of elective or complementary activity.

REFERENCES

- Caizaluisa, N. (2012). *Estrategias metodológicas alternativas para el aprendizaje del idioma inglés como segunda lengua* (Master's thesis, Universidad Técnica Equinoccial, Quito, Ecuador). Retrieved from <http://repositorio.ute.edu.ec/handle/123456789/12362>
- El Comercio. (2014, March 26). El déficit de profesores de inglés es un problema que viene desde 1950. *El Comercio*. Retrieved from <http://www.elcomercio.com/tendencias/deficit-de-profesores-de-ingles.html>
- Ministerio de Educación. (2011). *Acuerdo Ministerial No. 306-11*. Quito, Ecuador: Government Printing Office.
- Ministerio de Educación. (2014a). *Acuerdo Ministerial No. 0041-14*. Quito, Ecuador: Government Printing Office.
- Ministerio de Educación. (2014b). *Acuerdo Ministerial No. 0052-14*. Quito, Ecuador: Government Printing Office.
- Ministerio de Educación. (2014d). Ministro De Educación Explica El Fortalecimiento Del Aprendizaje Del inglés En El Sistema Educativo Del País (Ecuador). Retrieved February 18, 2016, from <http://educacion.gob.ec/ministro-de-educacion-explica-el-fortalecimiento-del-aprendizaje-del-ingles-en-el-sistema-educativo-del-pais/>
- Ministerio de Educación. (2016a). *Acuerdo Ministerial No. MINEDUC-ME-2016-00020-A*. Quito, Ecuador: Government Printing Office.
- Ministerio de Educación. (2016b). IT IS TIME TO TEACH IN ECUADOR PROJECT. Retrieved September 21, 2017, from <https://educacion.gob.ec/it-is-time-to-teach-in-ecuador-project/>

- Ministerio de Educación, Dirección Nacional de Currículo, & División de Idiomas Extranjeros. (2007). *Programa Nacional de inglés para los años 1o. a 7o. de la Educación Básica. Diseño Curricular por Competencias*. Quito, Ecuador: Government Printing Office.
- Ministerio de Educación y Cultura. (2000). *Acuerdo Ministerial No. 00001504*. Quito, Ecuador: Government Printing Office.
- Soto, S. (2014). An analysis of curriculum development. *Theory and Practice in Language Studies*, 5(6), 1129-1139.
- The CRADLE Project, Ecuador (n.d.). In British Council website. Retrieved August 30, 2014, from <http://englishagenda.britishcouncil.org/consultancy/our-track-record/cradle-project-ecuador>.
- UNESCO. (2010-2011, July). World Data on Education. Retrieved February 27, 2016, from http://www.ibe.unesco.org/fileadmin/user_upload/Publications/WDE/2010/pdf-versions/Ecuador.pdf

Enhancing English Speaking Interaction in Future Foreign Language Teachers: Case Study Corrective Feedback through Google Sheets

Eder INTRIAGO

*ELT Innovators Research Group
Universidad Laica Eloy Alfaro de Manabí
eder.intriago@gmail.com
Ecuador*

Jhonny VILLAFUERTE

*Universidad Laica Eloy Alfaro de Manabí, Ecuador
University of the Basque Country, Spain
Fellow of Senescyt, Ecuador
<http://orcid.org/0000-0001-6053-6307>
jhonny.villafuerte@gmail.com
Ecuador*

María Antonieta MORALES

*Universidad de Guayaquil
antonieta.moralesj@ug.edu.ec
Ecuador*

Vanessa MENDOZA

*Universidad Laica Eloy Alfaro de Manabí
vanessamendozalopez@gmail.com
Ecuador*

ABSTRACT

This action-research aims at improving future English language teachers' proficiency in English through the use of Corrective Feedback (CF) supported on Information and Communication Technology (ICT). Twenty two English teacher education undergraduates in Ecuador participated of a four-month educational intervention that involved literature circles (LC), written corrective feedback (WCF) from instructors, and self-correction supported on an adaptation of the Strategy Inventory for Language Learning (SILL). From observing recorded LC sessions, instructors and participants gave CF via two Google Sheets forms to monitor and enhance language acquisition. The findings showed that the participants incrementally improved their English proficiency. Additionally, several teaching and learning strategies supported on ICT were transferred to the soon to be primary and secondary English language teachers.

Key words: English learning, digital competences, corrective feedback, literature circles.

INTRODUCTION

Having as a horizon the challenges proposed by UNESCO (2015) for the global, peaceful, diverse and sustainable educational system for all in 2030, Information and Communication Technologies (ICT) have the potential to improve collaborative learning (Cabero, 2009); and these technologies have revolutionized the way people communicate and learn around the world (Armstrong & Franklin, 2008; Farhat & Kazim, 2011; Ince, 2014; Sprague, 2016).

However, it should be noted that despite the increase in the use of technology in educational institutions, pedagogical practices have not necessarily implied a substantial improvement of how languages are taught (Area, 2010).

Thus, teachers and students require of innovative strategies to reach higher and more effective educational results, avoiding the repetition of obsolete teaching strategies that only make use of a computer at the basic level. In addition, Burgues (2011) claims that in the search for new ways to promote a “learning to learn” attitude, the combined efforts of learners and teachers has proven to be of great value and greatly enhanced learning thanks to the incorporation of technology that allows virtual collaboration in the current interconnected and complex contexts where we participate as members of a digital society (Seely, 2012, p15).

This action-research study focuses on the combination of two types of Corrective Feedback (CF) on the oral performance of a group of learners in an English teacher education program in Ecuador, South America.

Current educational policies have made English a mandatory subject in the primary, and so it is expected that by the time a student finishes the secondary, where English has been part of the curriculum for 25 years, he or she will reach the B1 level of the Common European Framework of Reference (CEFR). Although many students in the secondary don't like English, they acknowledge it as a necessary tool required for accessing to prestigious higher education institutions (Education First, 2015). In view of this, and to help accomplish this objective, it is necessary for English language teachers to develop and apply teaching strategies that offer the English learning student population more access to quality education.

LITERATURE REVIEW

Educational interaction through internet

ICTs have impregnated the spheres of English language education, and the impacts are growing deeper and deeper (Ince, 2014). In this sense, Chun (2011) and Golonka et al. (2014) have stressed the fact that the web 2.0 allows for English as a Foreign Language (EFL) instructors to take advantage of social networking sites, virtual worlds, interactive games, cloud computing sites, among others in their classrooms. This has brought student participation, collaboration, and interaction to new levels.

Educational programs designed to strengthen foreign language communicative skills should take into account the advantages in these technologies to exploit cognitive aspects at the level of knowledge, experience, and ideas (Halliday, 2014), but in coherence to the learners' age, sex, and context.

Literature circles as English language learning strategy

Literature Circles (LC) are small peer-led discussions that involve reading in English as a foreign language (EFL). Literature circles have been associated with the learning strategies that produce a lot of benefits to the English language classroom. Ruben (1975) defined the term ‘learning strategies’ as “the techniques and devices which a learner may use to acquire knowledge” (p 43).

Holt and Bell (2000) list among the benefits of reading circles that the students position themselves as members and viewers of the world, and in that sense, they are invited “to feel, to question, to explore human values, and to examine traditions and cultures” (p. 5). Thus, it has been observed that students that get involved in the conversations as the result of reading, increase their interest for reading outside the classroom (Almasi, 1995). In fact, literature circles as spaces for conversations not only permit readers to understand the text, but also allow them to make sense of the readings in the subsequent discussions (Rowland and Barrs, 2013).

Video recording as a the source for Corrective Feedback

Video feedback has been used by teachers and scholars as a medium for giving feedback to students learning English as well as in the training of future teachers. (Tochon, 2008; (Farfán, G., Villafuerte, J., Romero, A., Intriago, E., 2017). Hayden (2012) argued that videos capture reality in ways far more precise than our memory is capable of. This makes it more accessible to capture the small details of spoken language. Hensley & Jordan (2009), adding to the previous claim, believed that observing the videos several times not only made possible a much more objective judgement of EFL learner's oral performance, but also of feedback given from their teachers. When learners use videos for self-evaluation and teachers for giving feedback to their students, the chances of this feedback being richer in details and deeper in analysis are much higher. Additionally, Reitmeier and Vrchota (2009) commented on another benefit for students, the transfer of knowledge that is achieved from self-evaluation transcends the classroom and it becomes a more personal experience.

However, videos pose some challenges. Video is a medium that because of its intrusive nature can cause anxiety during the recording process, (Nielson & Harder, 2013) and embarrassment in later instances (Hayden & Jordan, 2012).

SIMILAR STUDIES

A case study carried out by Shintani (2015) investigated the characteristics of computer-mediated synchronous corrective feedback and asynchronous corrective feedback in an EFL writing task. By means of an interview that was conducted immediately after the writing session to find out about the the writer's perceptions about the feedback they received. This research yielded results where synchronous corrective feedback was responsible for a dynamic writing process that in some aspects resembled oral corrective feedback. Also, both types of feedback allowed the participants to understand and reflect on the unique features of writing: having a slow pace, its permanency and accuracy.

In such context, this work answers the following question:

(i) To what extent does CF given by teachers and students themselves, supported in Google Sheets, help future English language teachers to improve their oral performance in English?

METHODOLOGY

Setting and Sample

The study was conducted in the college of education of a public university on the coast of Ecuador. The students were in the English teacher education program and came mostly from public high schools.

Participants

Twenty-two students in the ninth semester were purposefully selected to participate in the study, twelve male and ten female, in the ages between 22 and 45. They were informed and requested consent to participate in the investigation. The class used for this intervention was Literature Workshop whose main methodology was based on LCs. Although, the learners had prior experience working with LC, they were informed of the new additions: videotaping the LC sessions, a self-assessment questionnaire and a speaking performance rubric delivered via Google Sheets and Google Drive.

Instruments and tools

Likert-scale questionnaire for self-assessment used by the students

This is a tool adapted from the Strategy Inventory for Language Learning (SILL) originally developed by Oxford (1989), to evidence the participants' individual self-assessment. The form formatted as a Google Sheets form include 40 items to assess participants' use of memory strategies, cognitive strategies, compensation strategies, metacognitive strategies, affective strategies and social strategies in their process of learning EFL. Participants had to choose from 1 to 5, being

1. Never or almost never true of me
2. Usually not true of me
3. Somewhat true of me
4. Usually true of me
5. Always or almost always true of me

Speaking interaction performance rubric used by the teachers

This is a 5-scale rubric, also formatted in Google Sheets, that was designed from the language performance describing scales in the Common European Framework for languages: Learning, Teaching, Assessment (Consejo de Europa, 2001). The rubric allowed teachers to choose a qualitative description and give feedback in the following areas: vocabulary control, grammatical accuracy, phonological control, spoken fluency and propositional precision. The form also had a comment field to add positive or negative impressions about participant's performance, and make specific suggestions to improve their communicative and linguistic performance in English.

Literature Circles

A total of ten LC sessions were conducted with the participating class. Students were divided into four groups based on their English level: two beginning groups, one lower intermediate and one upper intermediate. There were five roles that were rotated every week. For each level, there was a set of graded books that they could choose from. Students in their groups decided which books to read, how many pages, and which roles to play as long as the roles did not get repeated. From the sixth session, students could repeat a previously played role. The roles that the students performed were discussion leader, bridge builder, artist, diction detective and reporter as proposed in Shelton-Strong (2012).

Reading material selected

A list of titles was preselected by the researching team as presented in figure 1, considering the students English level. The students were involved in the selection of titles, which was done to have them express their personal interests. The list of title is the following:

Books' Titles	Authors	Book's Gender	Level of complexity	ICT Activities support	Other activities
"Marcel and the Shakespeare Letters" Pearson Education Limited ISBN 0-582-42768-1	Stephen Rabley	Romance	Beginner	Audio CD	Reading and comprehension questions
"Girl meets boy" Pearson Education Limited ISBN 0-582-40111-9	Derek Strange	Romance	Beginner	Audio CD	Reading and comprehension questions
"The Last Photo" Pearson Education Limited ISBN 0582-40282-4	Bernard Smith	Adventure	Beginner	Audio CD	Reading and comprehension questions
"The Carnival" Pearson Education Limited ISBN 0-582-50530-5	Annette Keen	Romance	Beginner	Audio CD	Reading and comprehension questions
"Run for your Life" Pearson Education Limited ISBN 0140815643	Stephen Waller	Adventure	Beginner	Audio CD	Reading and comprehension questions
"Treasure Island" Pearson Education Limited ISBN 0 582 46828 0	Robert Louis Stevenson	Adventures	Lower Intermediate	Audio CD	Reading and comprehension questions
"King Arthur and Knights of the Round Table" Pearson ISBN 9781-4058-5532-7	Edited by Andy Hopkins and Jocelyn Potter	Adventure	Lower Intermediate	Audio CD	Reading and comprehension questions
"Lost Love and Other Stories" Pearson Education Limited ISBN 978-1-4058-8165-4	Edited by Andy Hopkins and Jocelyn	Adventure and Romance	Lower Intermediate	Audio CD	Reading and comprehension questions

	Potter				
‘The Wave’ Pearson Education Limited ISBN 0-582-41677-9	Morton Rhue	Suspense	Lower Intermediate	Audio CD	Reading and comprehension questions
“The strange case of Dr. Jekyll and Mr. Hyde” Black Cat Publishing ISBN 978 7 5617 3590 9	Robert Louis Stevenson	Mystery	Higher Intermediate	Audio CD	Reading and comprehension questions
“The Scarlet Letter” Black Cat Publishing ISBN 978-7-5617-6611-8	Nathaniel Hawthorne	Drama	Higher Intermediate	Audio CD	Reading and comprehension questions
“American Crime Stories” Oxford Woodworm Libraries ISBN 0194230791	Several Authors	Crime and Mystery	Higher Intermediate	Audio CD	Reading and comprehension questions

Figure 1. Selection of Readers used during the educational intervention

Video recording equipment

The participants' language performance was recorded using an iPhone 6s. The recordings were made during the discussion phase of the LCs. These sessions took place inside the designated classroom in the College of Education. The videos last from 15 to 25 minutes. These videos were uploaded into Google drive folder that was shared with students and teachers so they could access them for observing and completing the questionnaire and rubric.

THE EDUCATIONAL INTERVENTION

The intervention consisted of 4 steps. The activities and recommended ICT tools corresponding to each step are explained in figure 2.

Steps	Didactic activities	ICT tool recommended
1. Planning the educational intervention	1.- Setting English learning goals 2.- Choosing a role for discussion in groups 3.- Selecting the texts	Google drive
2. Execution of Literature Circles Time: 3 months	Individual Reading - input Group discussion - input and output Roles handouts – output	Distribution of text and listening material using Google Drive
3. Assessment (meta-analysis) Self-assessment External tutoring	1.Videotaping of LC session (discussion part) 2. Self-assessment through the individual observation of videos. 3. Giving feedback via Speaking Interaction Performance Rubric through the observation of videos on the part of the instructors.	Iphone 6s with adapted microphone Google Drive Google sheets
4. Re-start the Practice	The practice re-start activities from the step No. 2. Participants re-set new language goals and work on the weaknesses detected.	Google sheets Google drive

Figure 2. Educational Intervention Supported by ICT

RESULTS

Corrective feedback forms given via Speaking Interaction Performance Rubric - Qualitative assessment

Tables 1 and 2 present the analysis of two selected randomly students. There can be seen the comments made by one of the participating teachers.

Table 1.

Analysis of Participants' corrective feedback: Vocabulary control and Grammatical accuracy.

No.	Participant 1	Participant 2	Analysis
Vocabulary control	Score 3. Comment: I am happy that there are very few errors in the use of vocabulary, I think I did not notice any. But watching the videos so many times is a bit exhausting.	Score 2. Comment: More practice is required in the oral communicative part, not only to answer questions, but to communicate ideas based on solid reasons. There are words that maybe should be revised as "Beautiness" that do not exist but you certainly have the idea of the same "Beauty"	The students receive concrete suggestions to improve their vocabulary. Students venture words in their attempt to make meaning, even though the partly incorrect. As students are required to read the comments given, there is chance for extra support directly from the instructors.
Grammatical accuracy	Score 3. Comment: The student struggles to form sentences accurately. It is worth mentioning that the students is trying his best to retrieve structures that he has read and practiced. It seems it is a matter a practice in this case.	Score 3. Comment: It is noted that it strives to correct grammatical errors, but there are mistakes that are quite solidified in usual conversations that should improve, such as connectors, and verbal conjugations and their times. But I suggest you participate more so that you can continue to provide more efficient suggestions that could improve your oral production.	The teachers stresses the point that there are some fossilized error that require attention. In this case, the teacher asks the students to observe several categories of their discourse.

Table 2.

Analysis of Participants' corrective feedback: Phonological control, Spoken fluency and propositional precision.

Phonological control	Score 3. Comment: Attention. The pronunciation is not bad at all, only that the strong influence in the mother tongue sometimes denotes certain confusions that are related to the vowels, the same ones that are not in the mother tongue. It is recommended to practice the other 10 vowels that are not in Spanish. Another, timely observation is to relax the consonants so that they are not as sharp as the, P, T, R.	Score 4. Comment: It is noted that it strives to have a pronunciation that is closer to the natural, there are aspects that can be considered as the rhythm and volume, that cadence marked in the highs and lows make that when expressing the words are charged More strength and do not always feel as detached from what is meant	One other linguistic aspect is related to pronunciation. Students, in this description, are invited to consider the root of their weak pronunciation. Although the comment whose score is 4 provides info to sound more natural, the terminology employed might be an obstacle to comprehension.
Spoken fluency	Score 5. Comment: It is very well seen how you can maintain the flow of ideas, although these are quite linked to the knowledge of the subject, which is why more reading is recommended so that the increase in lexico is not only partial or required to a topic Specific, but to any idea.	Score 4. Comment: But I must insist that the participation is quite low, which makes it difficult to evaluate and advise effectively.	Fluency is encouraged to be developed apart from accuracy. Participant one is motivated to read more since the more they read the more content they have to share during the session. Participant two is indicating that students should act more so the instructor can evaluate more accurately their spoken performance.
Propositional precision	Score 3. Comment: Must work in tone and volume; In English there is a rhythm like in all the languages that are needed to emphasize conviction, desire, encouragement, etc. So you can brighten up your oral expression.	Score 2. Comment: Although it is true that the essential aspects are explained, a clear, detailed and reliable codification is not yet issued, probably because the interventions are limited to simply responding or participating in a limited way. Remember that the more you participate, the more you acquire dexterity.	Participant one is called his attention to communicate in more sophisticated way. The instructor, in participant two's case, is suggesting that in order to communicate elegantly and with candour, the learners have to try to participate more during the discussions.

2.- Learners' Self Assessment

In tables 3, 4 and 5 can be seen the selections that they made of their own performance during the spoken part of the literature circles.

Table 3.

Participants' perceptions about Memory and Cognitive Strategies used during conversations held in the LCs.

No	Items	1	2	3	4	5	N	Categories
1	I used new words in sentences or sentences that I built as exercise to remember them.	0	5	23	70	2	100	Memory Strategies
2	I tried to remember a new word by making a mental picture of a situation where I could use that word	0	2	19	12	67	100	
3	I used rhymes to remember new words from the readings.	0	4	72	22	2	100	
4	I repeated the new words several times	0	0	8	15	77	100	Cognitive Strategies
5	I practiced the sounds of English	0	0	6	90	4	100	
6	I used the words I know in different ways	0	6	21	73	0	100	
7	I started conversations in English this week	0	14	74	12	0	100	
8	I tried not to translate word for word.	0	0	8	24	68	100	
9	I read in English for pleasure this week	0	0	10	12	78	100	
10	I have written notes, messages in Whatsapp, Messenger, letters or informs in English	0	0	8	21	71	100	
11	I summarize what I read and hear in English	0	0	66	21	13	100	

Table 4.

Participants' perceptions about the Compensation and Metacognitive Strategies used during English conversations workshops

No	Items	1	2	3	4	5	N	Categories
12	When I did not know how to say a word in English, I used Spanish.	0	0	22	72	6	100	Compensation Strategies
13	I tried to guess what the other person is going to say	0	0	8	20	72	100	
14	If I do not remember how to say a word in English, I use a synonym.	0	0	5	21	74	100	
15	If I did not know how to say a word in English, I asked the speaker	0	11	86	3	0	100	
16	I helped myself with gestures when I did not know a word	0	0	10	78	12	100	
17	I avoided speaking in English when I felt I did not know the topic or the relevant vocabulary.	0	14	75	11	0	100	
18	I reduced ideas, omitted difficult information, and used simple words	0	0	4	89	7	100	
19	I invented new words when I did not know the proper in English.	3	78	12	7	0	100	Metacognitive Strategies
20	I paid attention to how my colleagues spoke in English.	0	6	11	19	64	100	
21	I am thinking and asking others how to be a better learner in English	0	10	87	3	0	100	
22	I planned my schedule to have enough time to study and perform	5	14	78	3	0	100	
23	I have clear objectives to improve my English skills.	4	11	8	72	5	100	
24	I know exactly how to improve my knowledge and skills in English	0	12	84	4		100	
25	I tried to read in English as much as possible	0	0	3	11	86	100	
26	I tried to find as many ways as possible to use and practice English.	0	5	8	76	11	100	
27	I have reflected on my progress in learning English	0	6	7	83	4	100	
28	I looked at my mistakes and used that information to help improve.	0	10	13	73	4	100	
29	I understand that part of learning English involves making mistakes	0	5	3	8	84	100	

Table 5.

Participants' perceptions about the Affective and Social Strategies used during English conversations workshops

No	Items	1	2	3	4	5	N	Categories
30	I tried to relax when I was tense when speaking English.	0	6	31	63	0	100	Affective Strategies
31	I risked speaking English even when I feared making mistakes.	9	11	10	66	4	100	
32	I rewarded myself when I did it right.	4	13	22	56	5	100	
33	I noticed when I got nervous @ studying or using English.	4	22	57	6	11	100	
34	I noted in a journal my feelings about learning English.	64	23	10	3	0	100	
35	I talked to someone about how I feel about learning English.	0	6	21	65	8	100	
36	I have been asked to correct me when I speak	0	12	58	24	6	100	Social Strategies
37	I have practiced English with other people	0	10	22	63	5	100	
38	I asked questions in English	0	13	10	73	4	100	
39	I have been learning about the culture of the English language	0	10	68	22	0	100	
40	When I have not understood something, I have asked them to speak more slowly or to repeat.	0	5	13	78	4	100	

DISCUSSION

This paper began with an essential question centered around the purpose of this investigation.

To what extent does CF given by teachers and students themselves, supported in Google Sheets, help future English language teachers to improve their oral performance in English?

In the application of literature circles whose students' spoken interventions were filmed for later analysis, it was possible to get a much clearer picture of the linguistic performance of future English language teachers. On the other hand, it was possible to give the students an opportunity to value the role that strategies play in learning a language, as well as the importance that self-regulation has in reaching higher levels of linguistic-communicative performance in English. Additionally, it was possible to see the levels of interaction that collaboration through technology brings to educational settings. Armstrong & Franklin (2008) and Farhat & Kazim, (2011) agree that ICTs are cyber environments with the power to promote collaborative learning for the construction of contents, the promoting of creativity and the participation in multiple ways where an exchange of authentic resources takes place. Also, ICT has proved to promotes learners' independence and autonomy (Cabero & Barroso, 2013). Students require opportunities to get exposure to the language, and opportunities to use the language. This was thought to make sense because it was hypothesized that contact with the foreign language is necessary to produce language. Also, it was expected that these learners also had opportunities to use the language they have learned during the phase of reading. The literature circles made that possible. But what was missing in a typical literature circle was an element that allowed the teacher to observe closely how the students actually use the language since the students may not be capable of identifying whether they are pronouncing correctly, or using the appropriate vocabulary or grammatical structure. The speaking interaction performance rubric allowed the instructors to observe the students as they shared the ideas and details of the stories read. As the comments kept coming from the instructors, the participating students became aware of specific suggestions that led them to apply strategies of different sort to improve their performance in the subsequent discussions.

Also, as was mentioned, the participants became aware of the good and the bad aspects regarding spoken performance in English. And in order to not make the same errors in the following sessions, they were given a form that allowed them to reflect on how they solved a specific problem when sharing information from their roles, or if they did not use one, to think of strategies for upcoming classes.

Another important element that is worth mentioning is the concept of self-regulation which good language learners make use of. According to Rubin (1975) a good learner is one that uses learning strategies and develops the habit of looking inside him or herself to regulate what he or she uses to solve or reach a communicative adventure.

Over the sessions, it was observed that the progress that students made were in two main areas, fluency and accuracy. Although the gains were not at a really high level, by watching the videos from the first week in comparison to those of tenth week, the differences could be observed easily. For example, the use of false cognates, e.g. actually, disappeared little by little. In the same fashion, problematic sounds such as /z/, /th/ or /t/ vs /d/ and /id/ in irregular verbs was brought to the students' attention and in various cases was solved by the students.

The use of Google sheets facilitated that teachers registered their impressions on the performance of the students. It additionally permitted that the students themselves not only participated in actions of correcting themselves, but also in a process of metacognition, letting them experience first-hand the power that regulating oneself has.

CONCLUSION

The purpose of this study is to share the findings of an educational intervention that involved giving learners CF to improve their English, and reflecting on strategies to make them better language learners. Next is the main conclusions reached after the completion of this work.

The success of educational projects that promote the use of ICT should consider learners' attitude towards implementing ICT in the classroom. The importance of this assertion lies in the fact that human attitudes have the power to change learners' perception and their reaction before situations and opportunities occur (Farhat & Kazim, 2011).

Students do benefit from an accompanying process conducted by teachers interested in helping students learn in an environment of collaboration and interaction via Google Drive and Google Sheets. Students and teachers work together to support the learning process from the written corrective feedback (so-called in English) by promoting metacognition and recognition of the powerful role of the learner

REFERENCES

- Almasi, J.F. (1995). The nature of fourth graders' sociocognitive conflicts in peer-led and teacher-led discussions of literature. *Reading Research Quarterly*, 30(3), 314–351. doi:10.2307/747620
- Area, M. (2010). The process of integration and the pedagogical use of ICT in schools. *Revista de Educación*, No. 352, Pp. 77-97. In http://www.revistaeducacion.educacion.es/re352/re352_04.pdf, captured (08, Feb, 2017)
- Armstrong, J. & Franklin, T. (2008). A review of current and developing international practice in the use of social networking (Web 2.0) in higher education. Franklin Consulting, 1-141
- Burgues, C. (2011). Comunidades educativas, de aprendizaje y aprendizaje cooperativo: puntos comunes y divergentes. En Vallés, J., Álvarez, D., & Rickenmann del Castillo, R. (2011). *L'Activitat docent: intervenció, innovació, informació*. Pp.241-248. Documenta Universitaria. España.
- Cabero, J. (2009). Tendencies for Digital Learning: from Readymade Content to Activity Centred Material Design. The Dipro 2.0 Project. *Revista de Educación a Distancia*. Num. 32. In <http://www.um.es/ead/red/32/cabero.pdf>
- Chun, D.M. (2011). Computer-assisted language learning. In E. Hinkel (Ed.), *Handbook of research in second language learning: Teaching and learning volume II* (pp. 663–680). New York, ny: Routledge.
- Consejo de Europa. (2001). *Common European framework of reference for languages: Learning, teaching, assessment*. Strasbourg, France: Council for Cultural Cooperation.
- Education First, EF. (2015). English in Ecuador. An examination of policy, perceptions and influencing factors. In <https://ei.britishcouncil.org/sites/default/files/latin-america-research/English%20in%20Ecuador.pdf>, captured (16. Feb. 2017).
- Farfán, G., Villafuerte, J., Romero, A., Intriago, E. (2017). Tecnologías de apoyo para el fortalecimiento de las

- destrezas comunicativas en lenguas extranjeras estudio de caso: Filmes cortos producidos por futuros docentes de inglés. *Píxel-Bit.Revista De Medios Y Educación*, 0(51), 183-195. doi:10.12795/pixelbit
- Farhat, J. and Kazim, S. (2011). The Role of Culture in ELT: Learners' Attitude towards the Teaching of Target Language Culture. *European Journal of Social Sciences* Vol. 23, No. 4. In https://www.researchgate.net/profile/Farhat_Jabeen7/publication/260045647_The_Role_of_Culture_in_ELTLearners%27_Attitude_towards_the_Teaching_of_Target_Language_Culture/links/0c96052f3541a25ccc000000/The-Role-of-Culture-in-ELT-Learners-Attitude-towards-the-Teaching-of-Target-Language-Culture.pdf , captured (10, Feb, 2017)
- Golonka, E.M., Bowles, A.R., Frank, V.M., Richardson, D. L., & Freynik, S. (2014). Technologies for foreign language learning: a review of technology types and their effectiveness. *Computer Assisted Language Learning*, 27(1), 70–105. doi: 10.1080/09588221.2012.700315235679
- Halliday, M. (2014). Introduction to functional grammar. Routledge. Fourth Edition. In [https://www.google.es/search?q=Halliday%2C+M.+\(2005\).+On+grammar&ie=utf-8&oe=utf-8&client=firefox-b&gfe_rd=cr&ei=IIOdWPufIMip8weUkY_IDQ](https://www.google.es/search?q=Halliday%2C+M.+(2005).+On+grammar&ie=utf-8&oe=utf-8&client=firefox-b&gfe_rd=cr&ei=IIOdWPufIMip8weUkY_IDQ) , captured (09, Feb, 2017)
- Hayden, S., & Jordan, E. (2012). Language for learning in the secondary school. New York: Routledge. doi:10.4324/9780203818442
- Hensley, J. (2009). Using virtual portfolios to improve presentations in an efl setting. *Journal of the Faculty of Global Communications, University of Nagasaki*, 10, 31–39
- Holt, J., & Bell, B.H. (2000). Good books, good talk, good readers. *Primary Voices K–6*, 9(1), 3–8
- Ince, M. (2014). The investigation of instructors' views on using technology in English language teaching. *Procedia-Social and Behavioral Sciences*, 141, 670–674. doi: 10.1016/j. Sbspro.2014.05.117
- Nielsen, B., & Harder, N. (2013). Causes of student anxiety during simulation: What the literature says. *Clinical simulation in nursing*, 9(11), e507-e512. doi:10.1016/j. Ecns.2013.03.003
- Oxford R.L. (1990). Language learning strategies: What every teacher should know. Rowley, MA: Newbury House.
- Rubin, Joan. (1975). What the "Good Language Learner" Can Teach Us. *TESOL Quarterly*, 41-51.
- Schalk, Ana Elena (2010). El impacto de las TIC en la educación. In <http://unesdoc.unesco.org/images/0019/001905/190555s.pdf>, captured (03.feb.2017)
- Seely, J. (2012). "Symposium and public lecture". In Mingfong Jan, Ai-Leen Lin Nur Haryanti Binti Sazali, Jarrod Chun Peng Tam, Ek Ming Tan. Learning in and for the 21st Century. In <http://www.johnseelybrown.com/CJKoh.pdf>, captured (09, Feb, 2017).
- Shelton-Strong, S. (2012). Literature circles in ELT. *ELT Journal*, 66(2), 214-223. doi:10.1093/elt/ccr049
- Shintani, N. (2015). The effects of computer-mediated synchronous and asynchronous direct corrective feedback on writing: a case study. *Computer Assisted Language Learning*, 29(3), 517-538. doi:10.1080/09588221.2014.993400
- Sprague, A. (2016). Improving the ESL Graduate Writing Classroom Using Socratic: (Re)Considering Exit Tickets. *Tesol Journal* Volume 7, Issue 4. <http://onlinelibrary.wiley.com/doi/10.1002/tesj.295/abstract> Captured (11.feb.2017)
- Tochon, F. (2008). A brief history of video feedback and its role in foreign language education. *calico Journal*, 25(3), 420–435.
- UNESCO (2015). Sustainable development goals. 17 goals for transforming our world. In <http://www.un.org/sustainabledevelopment/>

Enhancing the Online Experience: Improving Faculty Interactions in Blended Delivery

Dalton MERVOLD

Saskatchewan Polytechnic, Canada

dalton.mervold@saskpolytech.ca

ABSTRACT

This paper examines the use of online course delivery to reduce the time a student would spend in an on campus setting. It will look at the benefits and barriers from a faculty perspective. To be an effective online facilitator the faculty need to be aware of student perceptions and understand the need for enhanced communication methods. Student engagement hinges on the degree of interaction with the content, other students, and the course instructor. Educators that use online or blended courses need to be aware of the impact they have when creating an engaging learning environment. Data that was gathered from a pilot project will demonstrate the importance of student engagement and enhancements to the online learning environment that can be driven by program faculty. Overcoming barriers that faculty might have when developing and delivering online courses will be identified and solutions to these barriers will be examined. Designing interactive course materials that engage students and faculty will enhance the learning experiences.

INTRODUCTION

Over the past decade there has been a shift from traditional methods of course delivery to one that uses online technology. The use of internet based courses and resources have affected the way that students access materials and also the relationship between students and teachers. (Simonson et al., 2006, p. 230) Students are able to access course content and resources outside the traditional methods used in the past. The expanding network of the internet has opened the door of access not only to resources but also to courses, programs and degrees from educational institutes worldwide. The flood of information available to students has created a crossroads where instructional faculty must choose the best way to engage the students. If the traditional teacher-centered model is used the faculty deliver instruction, control the learning process whether that is done in a face to face or online delivery model. If they choose to move to a learner-centered delivery model then the role of the faculty changes to one of a coach, facilitator, and designer. It is this change to a learner-centered model that was used in a pilot to see if it would increase learner engagement in the courses. To do this there was a need for faculty training and a stepping away from traditional methods and embracing the transition to this different focus on learning. The results of this shift in roles should be more engaged learners and faculty that is focussing on creating interactions and providing feedback. (Simonson et al., 2006, p. 235).

THE METHODS

The first step down the path to designing and delivering online courses is to be aware of how the learner will interact with the course materials. Course descriptions and the use of very detailed course outlines and study guides are critical both for the learner and the faculty. (Haugen et al., 2017, p. 1605) Often all that is done is to take existing print based courses and simply put them up in an online environment. Effectively engaging the learner with content needs to be designed into the course, this can be done by having self-assessments to reinforce concepts or activities for the learner to practice newly learned materials. (Dick et al., 2007, p. 219) Although designing this type of interaction into the course is important for the learner, it is just as important that the faculty facilitating the course know how to watch these interactions and understand the value that they have for the learner. Viewing the learners progress will help inform the faculty if there are additional conversations or content that would help the learner as they move through the course. In a recent faculty training session this process was discussed, and the value of giving feedback to a learner that was struggling in an area of the course and was detected by the replies on self-assessments. Teaching online creates an environment where the faculty needs to be aware of student progress. Traditionally faculty just preparing and delivering the course outlines to the students, this leaves the interaction with the content up to the student. In an online course creating interactive materials allows the faculty to design opportunities like adding media, interactive self-assessments, and discussion posts to encourage the student to get involved in the content. (Dick et al., 2007, pp. 125-129)

Creating open communication between the student and faculty, student to student, and faculty to faculty are also key in enhancing the experience online. (Dabbagh & Bannan-Ritland, 2005, pp 84-86) The communication strategy that is used needs to be part of the faculty training prior to teaching online. Faculty sessions where the faculty actually use the communications tools and interact with each other around best practices when creating interpersonal interactions online let them experience the feeling of community that the students will also feel. Since this is a change from the typical classroom interaction it is not one that first time online faculty members would have experienced. Bonk states that since the technology is available and information and opportunities are available that faculty must experiment and engage with people and technology outside their typical spheres. He uses a term that is relatively new “The Web of Learning” and explains how this will influence the direction of education. (Bonk, 2009, p 394) The more engaged the faculty are can be witnessed in the courses by the students and other faculty. Creating an open communication space where ideas, concepts, and feedback are the norm will enhance the experience for everyone in the course. A faculty member’s passion for the course can be seen in the communications online just as it can be in the classroom. It was discovered that joining online learning communities provided support from colleagues who were already teaching online. This sharing of information simulated the learners experience in an online course. (Lizano-DiMare & Bruciati, 2016, p 1379)

Learning in a communications rich environment builds a sense of community for faculty members as well as the students. Regular interactions between faculty and students are key indicators for sense of belonging in the course. (Simonson et al., 2006, p. 171) Creating spaces within the online course where students can have discussions with each other helps to build the feeling of being part of a class. Discussion boards within a course are an excellent place to share information and provide additional links and information as needed to support the students. Assigning some grades for participation will encourage the students to participate in the discussions.

Building exercises that require the student to make contact with business and industry organizations to gather information that will be shared in course discussions is a great way to keep the courses authentic and insert new and current information into the learning environment. “At the Workplace” activities can be designed into the courses which would create an opportunity for students to make contacts in industry. When this information was posted in the discussions it allowed the other students and the instructor to get actual updates of actual practices, materials and technology. By selecting specific questions for the students to reply to in the posts the instructor would be able to stay updated with trends and changes in their discipline.

THE BARRIERS

When speaking to faculty about instructing online quite often the first response from a traditional in class faculty member is that it either cannot be done or that is not the best way to teach. That statement is really quite true, “it is not the best way to teach”. But that focus is on what they like to do, not which is the best way for the student to learn. There are some courses and some students that will always be taught in the traditional face to face setting and for those students, course, or faculty member maybe that is true. Some students need to be in the physical presence of the other learners and the faculty member to feel comfortable and safe. For these students maybe online courses are too much of a switch for them to handle. The same might be said of some faculty. There needs to be the desire to try the online experience and the attitude to do new and different things to assist the students.

Planning to succeed at engaging the students and being present in the course are critical in the successful engagement with the students. This can be one of the greatest barriers for faculty to remove. If a faculty member is not open minded and positive about making this new learning environment a great place to learn for everyone then that feeling will be passed on to the students and it will change the experience. Faculty must take the lead role in promoting the sense of community in the course and fostering a safe place to share and learn. Providing training to prepare and assist course faculty to work in an online environment is critical to the success of the course.

Financial barriers can also be an issue in some cases. Faculty will need to have time to help develop, design and create courses that will be both informative and engaging. This will require some training in using online communication tools, feedback tools and the pedagogical principles that are the basis for engaging the students.

The more the course faculty are aware of the best practices for online delivery and prepare the materials to be meaningful the greater the initial cost will be. Due to the nature of more individualized course interactions the time that course faculty spend preparing and facilitating the course the more expensive they will be.

In order to reduce the barriers for the institute and the faculty the senior management team must be aware and supportive of this shift to online delivery models. Information technology groups will also need to be onboard as they will be called upon to provide both student and faculty support.

The most difficult barrier to overcome is the attitude of the institute toward online learning and online course delivery. Overcoming all of the barriers depend on the will, desire, drive and need of the institution, faculty, support teams and the students. Without recognising the barriers and planning and preparing to remove them the vision for online delivery of courses would be difficult if not impossible.

THE SOLUTION

It is important to have some training sessions to facilitate the training for faculty to be online instructors. There are many resources that are designed to assist new online faculty to understand the importance of communications and setting clear instructions about how the course will run. (Boettcher, 2013) In a pilot that is currently running to shorten the length of time that trades apprentices spend on campus several things were added to some online courses to increase the communication on the faculty end. An introduction video was inserted at the very beginning of each course that featured the faculty member facilitating the course. In the introduction video the students had an opportunity to see their instructor as well as listen to them give some personal and some important course information. “The video should also give students a taste of the instructor’s personality, which can help dispel fears about learning online”. (Chapes, J. 2017, p 1136) Comments from the students when they attended the on campus portion of their training indicated that the welcome video made them feel that they knew who the instructor was and it made them feel welcome in the course. Regular opportunities for feedback and communication between the instructor and student were designed into the course materials. This assisted the instructor with having set areas where interactions with the student or students take place. Also every assignment that the student did had a requirement for the instructor to give feedback and guidance.

The faculty that were assigned to instruct the online courses were part of the team that designed the course. So they had some input in the course materials. This helped them understand how the course materials would be used and let them experiment in the learning management system. For most of them it was the first time they used a learning management system to deliver course materials the use of faculty trainers to demonstrate and show some best practices was helpful. There were 6 pilot faculty members that participated in the project. After the first phase of the pilot which included work on the course, the online delivery and the on campus instruction, the faculty members were interviewed. They all expressed similar comments around feeling that they had some connection with the students due to the online postings and discussions. When asked if this was different from a typical on campus cohort they all stated that there was a greater sense of community because they knew the students names, some had posted their pictures, and they knew some background information. Another practice that was well received was each student received a phone call at the beginning of the online course from the instructional faculty member. They also received personal feedback on every posting and assignment. This timely feedback kept the faculty engaged in the course and helped to monitor the work that was being done by the students.

From the online pilot we surveyed the faculty that facilitated the courses and here are some of the comments that we received:

- It didn’t take long for me to realize that I was forging a stronger connection with these “online” students than I ever would with a group of face to face students.

- This extra connection with the online students thrilled me as I realized that students who are well connected with instructors excel in the classroom. Also instructors who are well connected with students enjoy and perform their job better!
- We got off to a great start both during the block training because we already “knew” each other.
- Overall it was great experience and it is my hope that we expand and continue with online learning for apprentices.
- With communications as they are today, students had almost instantaneous access to me for help and I could deliver the help in a "real-time" fashion.

It is evident in the comments that preparing and providing training prior to delivering the online course did make a difference for the faculty. Their experiences were recorded and they had an opportunity to view the video together to learn from each other what worked and what it was like to experience an engaging online course.

Feedback about the course and the delivery should be requested throughout the course and not just at the completion as we so often do. The sooner the course faculty have student evaluation, either formal or informal, the quicker they can respond and reduce or remove barriers for the students. (Boettcher, 2013) This feedback can be used to modify the course to create greater opportunities for interactions and allow students to suggest additional resources that can be accessed by the others in the course.

Course faculty need to use authentic examples and experiences that will use their past experiences to create a real life learning experience. Using actual live and current examples will allow the instructor to demonstrate valid and professional competencies in the subject area. Online courses will heighten your awareness as a course instructor and open connections to a wider world of knowledge and experience. (Ko & Rossen, 2010, pp 20-22)

CONCLUSION

In an online course the faculty play a very important role in setting up and maintaining a safe and open community. The more tools the course instructor uses to engage the students the more the instructor will be engaged. Practicing using the tools of engagement will open up opportunities to enhance the teaching and learning experience for the instructor. The more engaged the course faculty is in the course materials, the student interactions, and professional communities better the online experience will be. With the burst of technology we see today the early online canned courses cannot compete with the interactive, engaging online courses that are available. One of the key factors in designing and delivering an interactive engaging online course is the role that the course faculty have to play.

REFERENCES

- Boettcher, J. V. (2013) Ten Best Practices for Teaching Online: Quick Guide for New Online faculty, retrieved from <http://www.designingforlearning.info/services/writing/ecoach/tenbest.html>
- Bonk, C. J. (2009). The world is open: How Web technology is revolutionizing education. San Francisco, CA: Jossey-Bass.
- Chapes, J. (2017). Online Video in Higher Education: Uses and Practices. In J. Johnston (Ed.), Proceedings of EdMedia: World Conference on Educational Media and Technology 2017 (pp. 1133-1138). Waynesville, NC: Association for the Advancement of Computing in Education (AACE).
- Dabbagh, N., & Bannan-Ritland, B. (2005). Online learning: Concepts, strategies, and application. Upper Saddle River N.J: Pearson/Merrill/Prentice Hall.
- Dick, W., Carey, L., & Carey, J. O. (2007). The systematic design of instruction. Boston: Pearson, Allyn and Bacon.
- Haugen, H., Ask, B. & Bjoerke, S.A. (2017). Training Teachers at all Levels in Pedagogical Approaches and Methods for Online and Blended Learning. In P. Resta & S. Smith (Eds.), Proceedings of Society for

- Information Technology & Teacher Education International Conference 2017 (pp. 1598-1606). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).
- Ko, S. S., & Rossen, S. (2010). *Teaching online: A practical guide*. New York: Routledge.
- Lizano-DiMare, M. & Bruciati, A. (2016). Faculty Development Initiative for Converting F2F Courses into Online Courses. In *Proceedings of E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2016* (pp. 1375-1380). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).
- Simonson, M. R., Smaldino, S., Albright, M., & Zvacek, S. (2006). *Teaching and learning at a distance: Foundations of distance education* (3rd ed., pp. 234-236). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

E-Portfolio Paradigm: Basis for Developing an Academic Conceptual Framework Tertiary Learning Performance

Arlene R. CABALLERO

College of Technology

Lyceum of the Philippines University

Manila City, Philippines

arlene.caballero@lpu.edu.ph

ABSTRACT

Among different institutions in the Philippines, the select institution in this study was one of the schools employing a portfolio system that collects and documents evidences of achievement of students. This study sought to answer what benchmarking results can be utilized as an input to the development of the E-portfolio framework for the select institution. In the early stage of this study, benchmarking technique was used to identify different institutions that employs collection of students' performances in a form of portfolio. The result of the initial study was the basis of development of conceptual framework of E-portfolio for the select institution. To be able to measure the students' achievement in learning, discussion of student performance, reflection and feedback, the development of E-portfolio was employed as it can be served as an effective tool (Ouyang, 2004). The initial goal and purpose of this portfolio was to collect evidences of student learning and showcase student work.

In the final stage of the study, it sought to answer what other factors can be integrated in the development of E-portfolio design. In this stage, other factors and framework that can be integrated in the development of design of E-portfolio were considered. This included related framework used in the development of interface design, database design and content. These components were utilized to produce desirable result throughout the process of achieving E-Portfolio design.

It was reported that the academic institutions implementing E-portfolio does not have a clear objective and purpose of E-portfolios. It was reported that the select institution was employing manual portfolio that leads to loss of evidences and expected bulk of file. Therefore, it was recommended that the project construction and implementation of E-portfolio may pursue for the continuous realization of its significance.

Keywords – *Learning Management System; Learning Performance; Student Portfolio;*

INTRODUCTION

A portfolio is "a collection of evidence that demonstrates skills, achievements, learning or competencies" (Love, 2004). As it is defined, accomplishments, achievements, skills, understanding, and interests are organized in such a way that the students work will be purposively collected for display or showcase as evidence of work and knowledge. These evidences may include reflective thinking, artwork, research projects, writing, reflection, videos, photos, or even observation from peers and mentors. Electronic portfolio may be defined according to its goal and purpose. It can be of two types in general - the working portfolio and presentation (Barrett H. &., 2006). Documentation of learning process which includes the collection of learner's artifacts are called working portfolio. This focuses on the process of portfolio and gives emphasis on the reflection of student work. On the other hand, the presentation portfolio focuses on the organization of set of learning outcomes. This portfolio creates a specific story of learning with goals or standard where a learner organizes the results of their learning process. These two types of portfolios can be purposively developed for career development, employment, achievement of course outcomes or achievement of specific standards (Barrett H. C., 2000) (Barrett H. C., 2013)

Due to the rapid advancement of technology, there is an increase in the use of e-learning tools to support learner-centered and self-phased learning. With this scenario, e-portfolio can be a motivation in bringing a new model of teaching, learning, and assessment.

The Lyceum of the Philippines University started to employ monitoring of student portfolio which keeps track record of the student's academic performances. These are done through manual process of collection and documentation of records and accomplishments of students such as performances, quizzes, projects and major exam results. The LPU portfolio system was employed however, the purpose and the content of the student portfolios were partially utilized.

In order to implement e-portfolio, an institution must decide based on its assessment needs and goals (Lorenzo, 2005). The goal of this study was to develop an electronic portfolio for the LPU that stored student performance to simplify data retrieval and reports. The student performance was stored by going through the process implemented in the conceptual framework for the LPU. The electronic portfolio provided a collection stage, reflection stage, selection stage and presentation stage that showcased student's work and performance online.

2.0 Related Studies

Portfolio may change its definition according to the use and purpose of the portfolio. According to (Arter, 1992), a portfolio is “a purposeful collection of student work that exhibits to the student, or others, her efforts or achievement in one or more areas. Portfolio is a purposeful collection of student’s work that exhibits the student’s efforts, progress and achievement in one or more areas.” In order to collect and select content for portfolio, student participation is needed. The collection should include the criteria for selection, the criteria for judging merit and evidence of student self-reflection (Paulson, 1991). To be able to understand the student knowledge, evidences must be present as a proof of knowledge. Hence, a container of collected evidences must be implemented in a form of Portfolio. This will serve as a documentation of evidences collected through time (Collins, 1992).

Portfolio has been used for different purposes. It is used in the assessment of student’s performance nowadays. Definition of portfolio may change according to users’ purpose and way of usage (BÝRGÝN, 2007). The design of portfolio depends on the purpose of it. On the basis of a literature analysis there is a clear conceptual link between the design of an ePortfolio and the purpose of it (Callens, 2007).

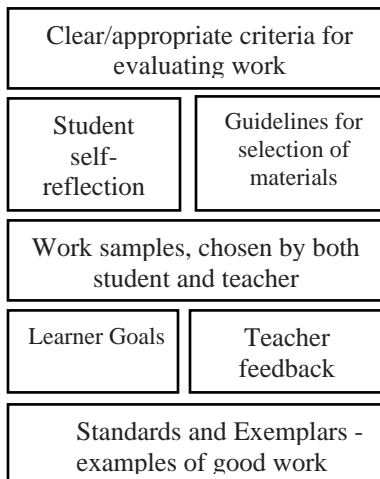
According to (Tierney, 1989), there is no "right" way to design portfolios. Each classroom, school district, and state will reflect a unique approach to authentic assessment, and in this sense, each student's collection of documents will differ somewhat, depending on the purpose of the assessment.

In the study conducted by (Lorenzo, 2005), it aims to review how selected higher education institutions have implemented assessment e-portfolio systems that demonstrate and assess learning. This demonstrates benchmarking on different higher education institutions based on best practices in their implementation of e-portfolio. The reflection of the study shows that the institution implementing the assessment e-portfolio must decide based on its assessment needs and goals (Lorenzo, 2005).

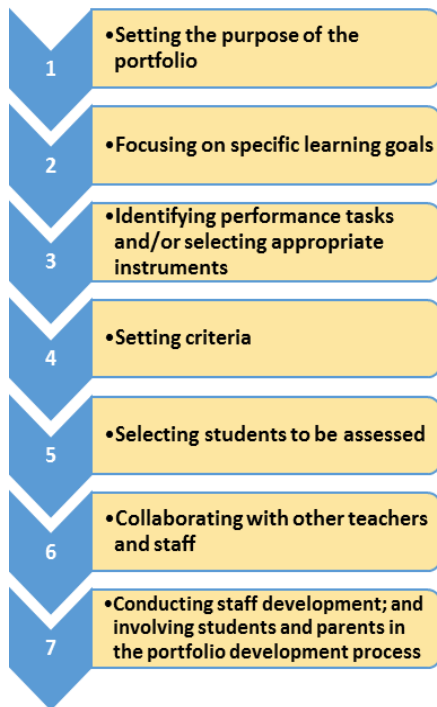
Content and Elements of E-portfolio

Base on the study conducted by (Barrett H. C., 2000), the following are the elements to be include in any portfolio (whether traditional or electronic).

Elements of Portfolio (Barrett, 2000)



According to (Pierce, 1992), portfolios can be designed following a multi-step process that involves the following:



3.0 Conceptual Framework

The content and conceptual framework of the LPU E-portfolio was the result of the research previously conducted by the researcher. These were drawn based on the benchmarking results from different institutions that integrates portfolio in their academic system and from the related studies presented in the early study of the E-portfolio paradigm.

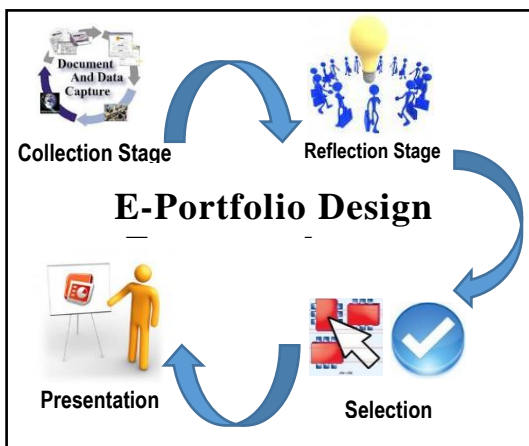


Figure 1 – E-Portfolio Framework

Collection. The Collection Stage is the preliminary phase of the LPU E-portfolio framework which includes creation, submission, and collection of student performances. This stage is initialized when the faculty member starts the creation of outcomes-based requirements of the student. In this stage, the teacher creates the project requirement, quiz, seatwork and assignment based on learning goals of each course. This allows the teacher to build and post student's requirement electronically.

The Collection stage also included the submission of work based on what the teacher posted in the LPU E-portfolio. The students can upload their work electronically and also received notifications from the system once the teacher received or graded the work of the students. Finally, the student performances were collected when the student submits their work online. The system automatically stores and collects the electronic files in the E-Portfolio database.

Reflection. The Reflection Stage of the LPU E-portfolio comprised the discussion and suggestion stage. In this stage, the students are free to discuss or ask their teachers about their artworks. The teachers can also provide comments and suggestion to the students with regards to their work and projects. In this way, the students have the time to reflect on their creation and improve their performance as well.

Selection. The Selection stage of the LPU E-portfolio was part of the initial presentation of student performances. In this stage, the students choose a template for their personal E-portfolio to make their portfolio appealing to the viewers. In this phase, the students can also choose their works and performances by selecting the electronic files available in the database. This showcases their outcomes and performances electronically through the web.

Presentation. The Presentation stage of the E-portfolio included showcasing and viewing of student works and performances. In this stage, guest viewers can glean on the student works through the web even without logging into the website. The viewers can simply provide the link on the browser to view the electronic portfolio of the students.

4.0 The User Interface Design

In the study, there were factors integrated in the development of user interface design of the E-portfolio. The interface design utilized the heuristic of Schneiderman's Eight golden rules of interface design which focus on the interface of a system (Sulaiman, 2009).

The Shneiderman's "Eight Golden Rules of Interface Design" became a guide to design the proposed E-Portfolio for the select institution. These eight principles of design are shown in Figure 2.

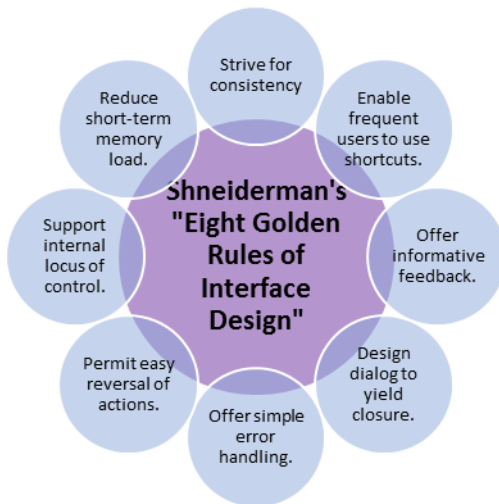


Figure 2 – Shneiderman's "Eight Golden Rules of Interface Design"

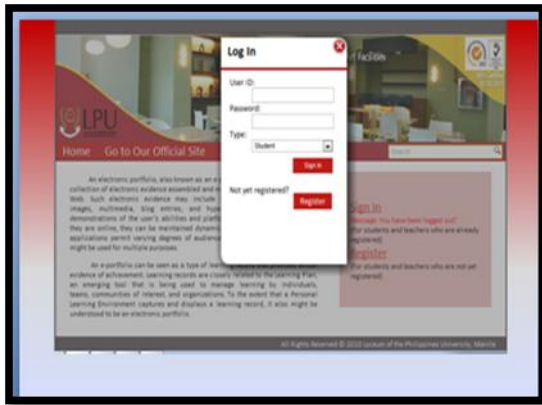


Figure 3 – E-Portfolio Log-In Page

Figure 3 illustrates the Log In page of the proposed LPU E-portfolio design. This was provided to impose security in E-portfolio. There were 3 levels of authorization imposed in the design: the Administrator, Teachers, and Students. Each users of E-portfolio were given username and password for security and privacy of information. Basically, the administrator has the full access to the system and has all the privileges to add, edit, and delete records from the database. There were also privileges for the administrator to create classes and add users.

On the other hand, the students were given the privilege to post personal information and keep record of their grades and schedule. While teachers were given the privileges to post assignments, projects and to keep class record as well.



Figure 4 – E-Portfolio Home Page

Figure 4 illustrates the design framework for the Student Account Home Page. This page is part of the E-portfolio collection stage. In this stage, students' academic works such as projects, quizzes, seatwork, assignments and other academic requirements can be submitted. The electronic files submitted by the students were collected and stored in the E-portfolio database. In this page, personal information of the students were also posted.

Basically, the Student Account Home Page has link modules such as Home, Academics, View Academics and My, Account. On the Academics module, there were links to Grades, Current Template, Ledger and Class Schedule. This part of E-portfolio submits the activities, reports and assignments of the students to their teacher electronically. This basically records all the submitted and returned documents of the students in the E-portfolio database.

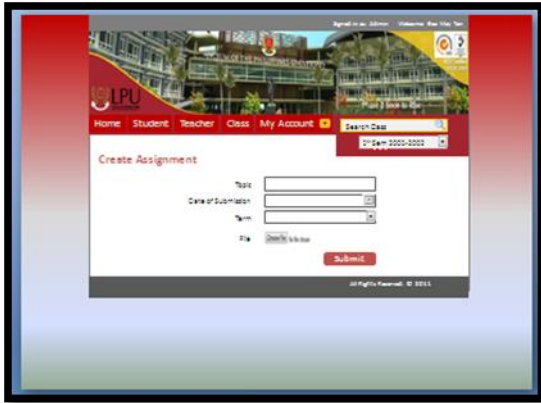


Figure 5 – E-Portfolio Create Assignment Page

Figure 5 illustrates the design framework for the Teacher Account Home Page. This page is part of the E-portfolio collection stage. In this portion of the E-portfolio, teachers can create academic requirements such as projects, quizzes, seatwork, assignments and other student performances electronically. These activities can be created and posted directly to individual student accounts who are currently enrolled in the courses. The electronic files created by the teachers were also collected and stored in the E-portfolio database. In this stage, teachers are being notified about the status of the submission of the students. Reports who among the students were already submitted their works are also being provided in this module. This can help the teachers to monitor their students and keep record of grades, assignment details, and date of submissions.



Figure 6 – E-Portfolio Discussion Page

Figure 6 illustrates the design framework for the Discussion Page. This page is also part of the reflection stage in the E-portfolio framework design. In this stage, students can response and give comment. As well as feedback with respect to the improvement of their work suggested by their teachers. This part of the E-portfolio provides a venue for discussion and clarifications in a form of forum to improve the students' works. This open communication provides reflections on the performance of the students for continuous improvement of learning goals.

Figure 7 – E-Portfolio Presentation Page

Figure 7 illustrates the design framework for the Presentation Page. This page is part of the Presentation stage in the E-portfolio framework design. In this stage, the students can customize their home page to make their E-portfolio appealing to their viewers and showcase their academic performances. The design framework of LPU E-portfolio provides different designs to choose from. Student can also save and upload new design templates if they prefer to have a personally designed account in the LPU E-portfolio.

5.0 Results and Discussion

Table 1.0 Assessment of LPU E-Portfolio.

Criteria		
	\bar{X}	V.I
Functionality	4.42	Very Good
Usability	4.60	Excellent
Reliability	4.48	Very Good
Efficiency	4.43	Very Good
Maintainability	4.43	Very Good
Portability	4.51	Excellent
Total	4.48	Very Good

As gleaned from the Table 1.0, it revealed that two of the criteria in the Assessment of LPU E-portfolio was rated “Excellent” and majority of the criteria was rated “Very Good”. As shown in the table, “Usability” and “Portability” had rate of “Excellent”. It has weighted means of 4.60 and 4.51, respectively. As the data disclosed, the “Functionality”, “Reliability”, “Efficiency” and “Maintainability” were rated “Very Good”. The criteria “Functionality” and “Reliability” had weighted means of 4.42 and 4.48, respectively while “Efficiency” and “Maintainability” had the same weighted mean of 4.43. It was noted that the respondents rated the LPU E-Portfolio software positively.

CONCLUSION

The proposed LPU E-Portfolio can be used and can be implemented as a tool for collection of evidence that demonstrates skills, achievements, learning or competencies of the students electronically. Moreover, E-Portfolio should be developed in full module and be used as an alternative tool for collection and archiving student performance to document learning process and competencies. Other modules can also be developed or integrated in the LPU-E-Portfolio such as Learning Module Systems (LMS). It is a relevant input or source of students work and data archive. The integration of other modules or system related to student performance such as grading system is recommended as well since the e-portfolio is a data archive of students work.

It is also recommended that the students and faculty be trained once the E-Portfolio is implemented. The project construction and implementation of e-portfolio is highly recommended for the continuous realization of its significance.

REFERENCES

- Arter, J. A. (1992). Using portfolios of student work in instruction and assessment. *Educational measurement: Issues and practice*, 11(1), 36-44.
- Baki, A. &. (2004). Reflections of using computer-based portfolios as an alternative assessment tools: A case study. *The Turkish Online Journal of Educational Technology*, 3(3), 79-99. Retrieved from <http://www.tojet.net/articles/3311.htm>
- Barrett, H. &. (2006). Conflicting paradigms in electronic portfolio approaches: Choosing an electronic portfolio strategy that matches your conceptual framework. Retrieved from <http://electronicportfolios.org/systems/paradigms.html>
- Barrett, H. (2004). *My online portfolio adventure*. Retrieved April 14, 2009
- Barrett, H. C. (2000). Create your own electronic portfolio. *Learning and leading with technology*, 27(7), 14-21.
- Barrett, H. C. (2013, June 30). *My online Portfolio Adventure: Versions of My Online Portfolios Developed Using Different Systems Or Online Publishing Tools*. Retrieved January 20, 2017, from <http://electronicportfolios.com/myportfolio/versions.html>
- BÝRGÝN, O. a. (2007). The Use of Portfolio to Assess Students' Performance. *Journal of Turkish Science Education*, 4(2), 75.
- Callens, J. C. (2007, September 26-28). Purpose and design of an ePortfolio. *In Conference ICL2007*, 3.
- Collins, A. (1992). Portfolios for science education: Issues in purpose, structure, and authenticity. *Science Education*, 76(4), 451-463.
- Cooper, T. &. (2001). Online portfolio assessment in information systems. (E. C. Perth: We-B Research Centre, Ed.) *Working for Excellence in the E-conomy*, 417-426.
- Cooper, T. &. (2001). Online portfolios: issues of assessment and pedagogy. *AARE*, 417-426.
- Lorenzo, G. a. (2005, September). *"An overview of e-portfolios (ELI paper 1)*. Retrieved from EDUCAUSE : <http://www.educause.edu/ir/library/pdf/ELI3001>
- Love, T. a. (2004). "Designing online information systems for portfolio-based assessment: Design criteria and heuristics.". *Journal of Information Technology Education* 3 , 65-81.

- Ouyang, J. R. (2004). E-portfolio for in-service teachers training: Beauty and thorn. *Society for Information Technology & Teacher Education International Conference* (pp. 215-218). Association for the Advancement of Computing in Education (AACE).
- Paulson, F. P. (1991). What Makes a Portfolio a Portfolio? *Educational leadership*, 48(5), 60-63.
- Pierce, L. V. (1992). Performance and Portfolio Assessment for Language Minority Students. *Program Information Guide Series*, 9.
- Sulaiman, J. T. (2009). Implementing Usability Attributes In E-learning System Using Hybrid Heuristics. *Information and Multimedia Technology, 2009. ICIMT'09. International Conference*, 189-193.
- Tierney, R. J. (1989). Portfolio assessment in the reading-writing classroom. *E.(1991)*.

Evaluation of the Quality of Ecuadorian University Websites

Carlos VEGA

Grupo de Investigación y Comunicación web GICOWEB

Universidad Técnica de Machala

Ecuador

cxvega@utmachala.edu.ec

Jennifer CELLERI-PACHECO

Grupo de Investigación y Comunicación web GICOWEB

Universidad Técnica de Machala

Ecuador

jcelleri@utmachala.edu.ec

Jorge MAZA-CORDOVA

Grupo de Investigación y Comunicación web GICOWEB

Universidad Técnica de Machala

Ecuador

jlmaza@utmachala.edu.ec

ABSTRACT

This research work aimed at evaluating the quality of the websites of 52 Ecuadorian universities through the definition of evaluation parameters and the selection of tools of analysis. First, we determined six evaluation parameters and their criteria. For their establishment, we considered international standards such as ISO / IEC 25010 and the W3C (World Wide Web Consortium). The parameters established were Functionality, Usability, Portability, Efficiency, Compatibility and Positioning. Then, we selected eight quality analysis tools that meet the requirements of the parameters selected. The results obtained from the tools of analysis were weighted, placing the websites in a national ranking. The evaluation identified the improvements that website administrators must make to ensure the quality of their sites. The parameters that need more attention are positioning and accessibility. This form of evaluation can be adopted by the institutions or regulatory bodies that seek to ensure the quality of the web service provided by Ecuadorian universities.

INTRODUCTION

Universities were one of the first organizations to use the WWW web service (Molina et al., 2004), an effective way of offering university services. These websites are the most widely used in the world (Jatmiko Suwawi, Darwiyanto, & Rochmani, 2015). Therefore, universities should meet the characteristics that guarantee their quality.

There are some organizations that verify the quality of websites, including the ISO (International Standard Organization) and the W3C (World Wide Web Consortium). These organizations have developed standards and guides for the fulfillment of such standards. For instance, ISO issued the ISO / IEC 25000 based on ISO / IEC 9126, ISO / IEC 14598, has also presented ISO / IEC 25010 and ISO / IEC 9126. These standards are used for evaluating the quality of websites through a Finite number of parameters (ISO, 2016a).

Different studies, methods, questionnaires, proposals, and models have been developed to evaluate the quality of websites based on these standards. From them, we can highlight the evaluation of television websites focused on 32 indicators (Díaz Campo, 2014); evaluation of libraries through indicators of design-usability and content-services (García Fernández, 2013); exhaustive web model of school libraries (Pérez & González Mateos, 2013); evaluation of conditions, tasks, and objectives to verify the accessibility and access to information (Melo Alves & Quiroa Herrera, 2007); evaluation of postgraduate programs websites through a checklist, automated tools, and the fulfillment of tasks detailed in a questionnaire as part of the research process (Olvera & Aguilar Soto, 2011); proposals that include 8 evaluation parameters with 36 indicators on cybermedia (Rodríguez Martínez, Codina, & Pedraza Jiménez, 2012); evaluation of sites using an agile methodology and re-engineering (Benigni, Ordaz, Gervasi, & Pallottelli, 2011); evaluation of sites using a questionnaire to verify compliance with quality criteria for health websites (Bermúdez Tamayo et al., 2006), research methodology based on a template with a total of 12 topics and 154 indicators (García Fernández, 2013). **Table 1** compares these studies and their indicators.

Most of the indicators that guide these studies involve the ISO / IEC 25010 standards. The W3C, for its part, develops guidelines for accessibility of web content (WCAG) through the Web Accessibility Initiative. The W3C pretends that the websites are accessible to people with disabilities (W3C, 2016). Based on these regulations, the NTE INEN-ISO / IEC 40500 technical regulation came into force in Ecuador since August 2016. This regulation directs the compliance with basic levels of accessibility on government websites.

of Evaluation, Accreditation and Quality Assurance of Higher Education - CEAACES- evaluates the quality of universities following the model of institutional evaluation designed for evaluating Universities and Polytechnic Schools of Ecuador (CEAACES, 2016). Furthermore, institutions of the Ecuadorian government count with an Electronic Government which focuses on the use of Information and Communication Technologies (ICT) to improve their information services (Gobierno Electrónico, 2014). Unfortunately, in Ecuador, little or nothing has been done to analyze, evaluate, and ensure the quality of university websites. Therefore, in this work, we evaluate the quality of university websites of Ecuador through the analysis of the best parameters and tools to establish a new evaluation model.

Table 1. General indicators in previous studies

Indicator / Author	Television Websites	Library Websites	Library Websites	Postgraduate programs Websites	Cybermedia Websites	Health Websites
	García Fernández	Pérez & González	Melo & Quiroa	Olvera & Aguilar	Rodríguez, Codina, Pedraza &	Bermúdez Tamayo
Website menu	X	X	X			
Complete URLs	X					X
Browsing	X	X		X	X	
Homogeneity	X					
Resources quality	X		X	X	X	
Readability	X	X				X
Web standards and programming	X					
Implementation of good practices	X					
Compatibility among browsers	X					
Website logo	X	X	X			
Adequate design		X		X	X	
Multilingual		X	X			
Accessibility			X	X		X
Adequate font type and size		X	X			
Appropriate Visibility				X		
Contents quality		X		X	X	X

A series of steps were followed to conduct this study, applying a rigorous standard procedure of observation and measurement. The steps are as follows:

- 1) Selection of websites.
- 2) Identification of a set of parameters to be evaluated in a website by using a methodology of theory that is grounded in scientific and analytical contributions in this area.
- 3) Selection of tools of analysis for each indicator by using laboratory tests.
- 4) Testing of the sites of 52 universities selected.
- 5) Generation of top ten rankings for each parameter and an overall ranking from the results obtained.

Procedure

ISO / IEC 9126 is among the most widely used standards. This standard was unified with ISO / IEC 14598 to create the ISO / IEC 25000. The subdivision 25010 of the ISO / IEC 25000 evaluates quality through evaluation parameters that are similar to those of the ISO / IEC 9126.

We analyzed the parameters of the ISO / IEC 25010; functionality, performance, compatibility, usability, reliability, security, maintainability, and portability. Such parameters omit reliability and maintainability because the site development team are the only individuals who have access to these parameters, which makes it difficult to evaluate them. Reliability focuses on maturity, fault tolerance, resilience and compliance with it (ISO, 2016b); in other words; it indicates how the software recovers through the occurrence of a failure. On the other hand, maintainability refers to the effort required to the site to adapt to new specifications and requirements, including analysis, variability, stability, ease of testing, and compliance with maintainability (González López, Bañegil Palacios, & Buenadicha Mateos, 2013). In addition to the parameters selected, we also include the parameter concerned with search engine positioning. Therefore, the parameters that should be considered to evaluate the quality of websites include Functionality, Performance Efficiency, Portability, Compatibility, Usability and Positioning in search engines.

We evaluated 28 tools through laboratory tests. The evaluation tested that the tools met the following points:

- Test the 52 websites of the universities of Ecuador satisfactorily.
- Be freely accessible.
- Have online access.
- Evaluate the most criteria of the parameters selected.
- Present the results with clear visualization and easy interpretation.

From the tests conducted, we found out that nine tools were open source tools; all the tools are accessed online, and some of them integrate more than one evaluation parameter.

To measure the functionality parameter, we used the W3C tools: both the HTML and Unicorn Validator were developed by the W3C to check the correct compliance of web standards such as HTML and CSS (World Wide Web Consortium, 2015a)(World Wide Web Consortium, 2015b). On the other hand, GtMetrix was employed to evaluate the performance efficiency by integrating it with tools such as Google PageSpeed Score and Yahoo Yslow; such integration aided to learn the different requirements of this parameter (GT.net, 2017). We also selected MetricSpot, which is a tool oriented to provide advice on SEO and digital marketing (Metricspot, 2017), as well as the Functional Accessibility Evaluator 2.0 tool developed by the University of Illinois to provide support on web accessibility (Universidad de Illinois). To evaluate the portability, we used Website.grader, which was developed by the HubSpot company

that is responsible for increasing customers through marketing (HubSpot, 2017); we also used the ReadyMobi tool, which is available to developers of websites and mobile devices (Afiliat Technologies, 2016). For the evaluation of search engine positioning, we applied the Moz Bar tools (Moz, 2017). The MOZ company developed the Moz Bar tools; their extension for web browsers indicates the SEO score on the domain of a website and MetricSpot (Metricspot, 2017). Compatibility was measured with Microsoft Browser Shots (Microsoft, 2016), whose function is to show the behavior of a website in different popular browsers and different operating systems, including mobile operating systems. Finally, Security was evaluated by using the ScanMyServer tool. This tool presents the vulnerabilities of both the server and the website (Beyond Security Inc, 2016). Therefore, due to the sensitivity of the evaluation performed by this tool, the results of this parameter will not be presented. We strongly recommend its use for internal evaluations only.

The results of each evaluation parameter are weighted to a 10 points value because we consider all of them have the same level of importance.

According to the evaluation parameters

In the tables included in this section, we present a top ten for each parameter accompanied by its criteria and the qualification obtained from the tools used. The highest score has a 10 point value and the lowest a 0 point value. Under the name of each university listed in the top ten, we find the category to which it belongs to (A - D). A is the category with the highest value and D, the category with the lowest value. We also find the nature they belong to (public or private).

Functionality. It reviewed the markup language code (HTML) and Cascading Style Sheets (CSS), evaluating the number of errors. The optimal score was reached with the least number of errors as shown in **Table 2**. **Figures 1** and **2** show that categories B and C occupied 40% and category C 20% from the top ten. Regarding the nature of institutions, private institutions reached 80%.

Table 2. Functionality Top ten

#	University (Category – Nature)	Total HTML			Total CSS			Score
		Errors	Warnings	Score	Errors	Warnings	Score	
1	Pontificia Universidad Católica del Ecuador (B – Private)	3	2	9,9165	0	0	10	9,9583
2	Universidad Tecnológica Empresarial de Guayaquil (B – Private)	6	0	9,9604	12	22	9,9134	9,9369
3	Universidad Estatal Península de Santa Elena (C – Public)	13	1	9,8824	5	158	9,7964	9,8394
4	Universidad de Especialidades Turísticas (C – Private)	1	2	9,9297	20	220	9,6494	9,7896
5	Universidad Tecnológica Israel (C – Private)	11	5	9,7682	7	190	9,7501	9,7592
6	Universidad Tecnológica Indoamericana (C – Private)	39	3	9,6472	12	103	9,8223	9,7348
7	ESPOL - Escuela Superior Politécnica del Litoral (A – Public)	0	2	9,9363	58	197	9,4797	9,7080
8	Universidad Católica de Santiago de Guayaquil (B – Private)	18	3	9,7857	16	354	9,5193	9,6525
9	Universidad Técnica Particular de Loja	33	1	9,7505	87	7	9,5441	9,6473

	(B – Private)							
10	Universidad de Especialidades Espíritu Santo (A – Private)	13	3	9,8187	85	199	9,3384	9,5786

Figure 1. Percentages of functionality considering the category of the universities.

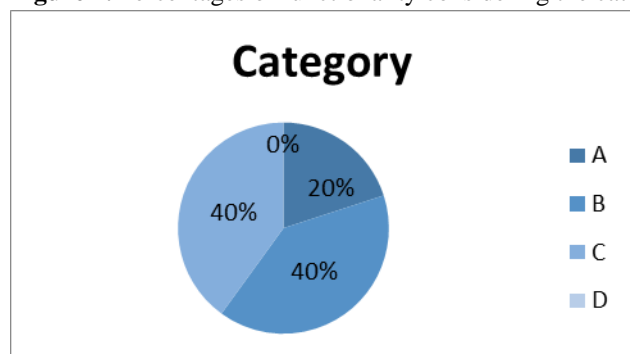
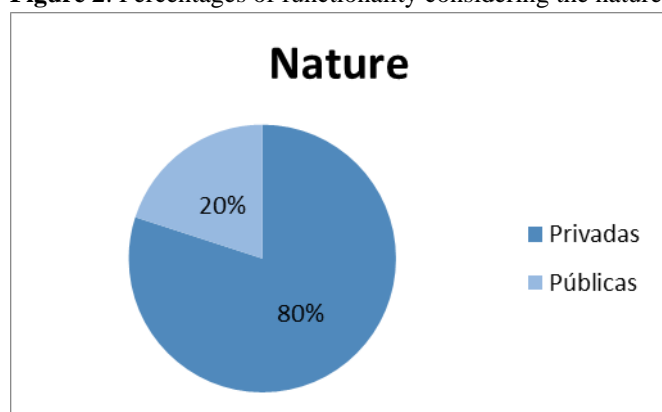


Figure 2. Percentages of functionality considering the nature of the universities.



Efficiency. It evaluated the recommendations and best practices on the efficiency provided by Google; the results of this evaluation are shown in **Table 3**. Category B universities predominated in this top ten with 50% as shown in **Figure 3**.

Similarly, in **Figure 4**, we can see that private universities had a high representation in the top ten reaching 70%.

Table 3. Efficiency Top ten.

#	University (Category – Nature)	Total Efficiency	Total /10
1	USFQ - Universidad San Francisco de Quito (A – Private)	9,5	10
2	Universidad Técnica de Cotopaxi (C – Public)	9,2	9,6512
3	Universidad de los Hemisferios (B – Private)	9,1	9,5349
4	Universidad Internacional del Ecuador (B – Private)	9,1	9,5349
5	Universidad Tecnológica Empresarial de Guayaquil (B – Private)	8,9	9,3023
6	Universidad Tecnológica ECOTEC (C – Private)	8,8	9,1860
7	Universidad de Especialidades Espíritu	8,7	9,0698

	Santo (A – Private)		
8	Universidad Central del Ecuador (B – Public)	8,7	9,0698
9	Universidad de las Américas (B – Private)	8,7	9,0698
10	Escuela Superior Politécnica Agropecuaria de Manabí (C – Public)	8,6	8,9535

Figure 3. Percentages of efficiency considering the category of the universities.

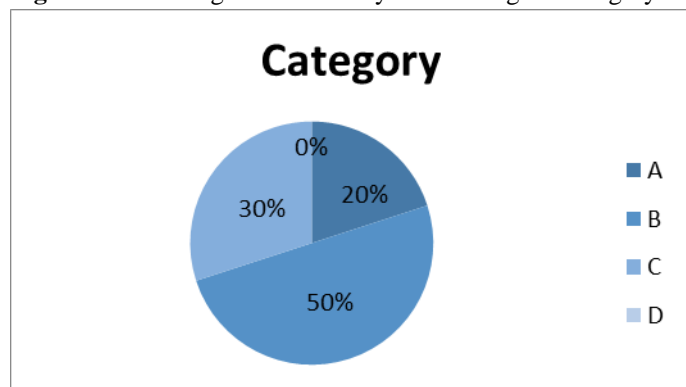
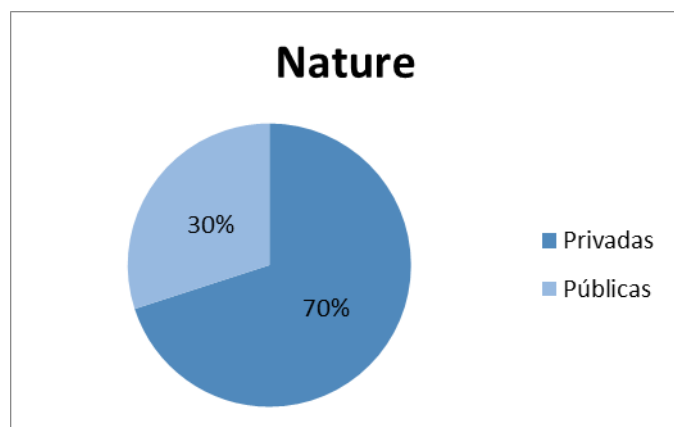


Figure 4. Percentages of efficiency considering the nature of the universities



Portability. It evaluated whether the sites were responsive (1 point); whether they had the meta-view port tag (1 point); whether they evidenced adaptability when using a web browser adjusted to different sizes (1 point). In addition to these points, we added the score of The Ready Mobi tool. The results of these criteria are shown in **Table 4**. **Figures 5** and **6** demonstrate that 40% of the results is shared by universities that hold the categories B and C. 80%, on the other hand, belongs to private universities.

Table 4. Portability Top ten.

#	University (Category – Nature)	Automated adaptability		Manual adaptability	Ready Mobi	Total	Total /10
		Responsive	Viewport	Manual			
1	Universidad Tecnológica Israel (C – Private)	1	1	1	1,82	4,82	10
2	Universidad Laica Eloy Alfaro de Manabí (D – Public)	1	1	1	1,61	4,61	9,5643
3	Universidad Iberoamericana (B – Private)	1	1	1	1,18	4,18	8,5778
4	Universidad Tecnológica Indoamérica (B – Private)	1	1	0	2,08	4,08	8,3558
5	Universidad Politécnica Salesiana (B – Private)	1	1	1	1,05	4,05	8,2889
6	Universidad de las Américas (B – Private)	1	1	1	1,03	4,03	8,2444
7	Universidad de Especialidades Espíritu Santo (A – Private)	1	1	1	0,92	3,92	8,0000
8	Universidad Estatal del Sur de Manabí (D – Public)	1	1	1	0,9	3,9	7,9556
9	Universidad Politécnica del Carchi (B – Public)	0	0	0	3,87	3,87	7,8889
10	Universidad Católica de Santiago de Guayaquil (B – Private)	1	1	1	0,84	3,84	7,8522

Figure 5. Percentages of portability considering the category of the universities.

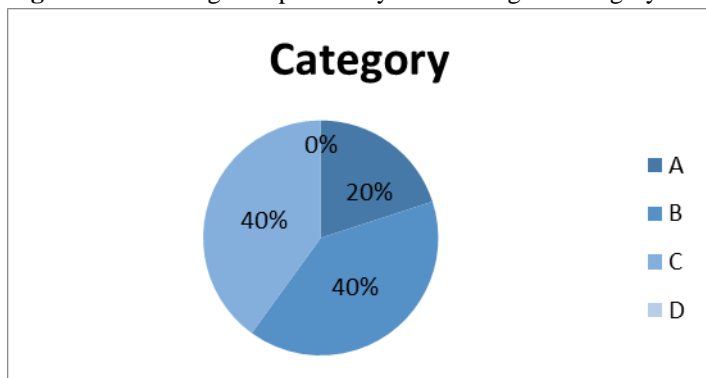
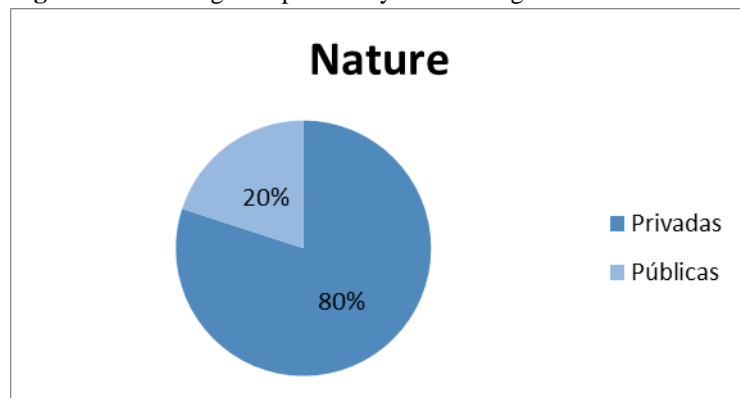


Figure 6 Percentages of portability considering the nature of the universities



Usability. It evaluated whether the sites complied with requirements such as correct domain name (1 point); whether they presented a custom error page (1 point); whether the sites had a language tag in HTML syntax (2 points if correct; 1 point if incorrect; 0 if it did not exist); whether the sites had a Favicon (2 points if correct; 1 point if incorrect; 0 if it did not exist); whether the sites included search tools (3 points if the site had Google and the websites' search tools; 2 points if it had an internal search; 1 point if it only had Google search; 0 if the site did not have search tools); whether the sites included mobile optimization (1 point for meeting each of the following requirements: existence of CSS for mobile devices, meta viewport tag, icon for Apple devices, not flash usage, not mobile redirect usage, and use of a responsive web design); whether the sites showed where in the site the user is located (1 point if it existed, 0 if it did not exist); whether the sites contained accessibility guidelines for web content based on WCAG 2.0 (3 points if complete; 2 points if almost complete; 1 point if partial implementation; 0 if incomplete). The results of the top ten of this parameter are displayed in **Table 5**. **Figure 7** shows that category B universities represented the majority in this parameter with 50% and private universities reached 70% according to **Figure 8**.

Table 5. Usability Top ten.

#	University (Category – Nature)	Domain's name	404 Error page	Language	Favicon	Search tool	Mobile Optimization	Route Guide	FAE 2.0	Sum (80)	Total
1	Universidad San Francisco de Quito (A – Private)	10	10	10	10	6,67	10	10	7,3	73,97	9,25
2	Universidad de las Américas (B – Private)	10	10	10	10	6,67	10	10	6,4	73,07	9,13
3	Universidad de Especialidades Espíritu Santo (A – Private)	10	10	10	10	6,67	8,33	10	6,7	71,7	8,96
4	Universidad Internacional del Ecuador (B – Private)	10	10	10	10	6,67	8,33	10	6,1	71,1	8,89
5	Universidad Casa	10	10	10	10	6,67	8,67	10	7,7	71,04	8,88

	Grande (B – Private)										
6	Universidad Regional Autónoma de los Andes (C – Private)	10	10	10	10	6,67	8,33	10	5,9	70,9	8,86
7	Universidad Nacional de Loja (B – Private)	10	10	10	10	6,67	6,67	10	6,5	69,84	8,73
8	EPN - Escuela Politécnica Nacional (A – Private)	10	10	10	10	6,67	6,67	10	5,5	68,84	8,61
9	Universidad Iberoamericana (B – Private)	10	10	10	10	0	10	10	7,2	67,2	8,40
10	ESPOL - Escuela Superior Politécnica del Litoral (A – Private)	10	10	10	10	10	8,33	0	8,6	66,93	8,37

Figure 7. Percentages of usability considering the category of the universities

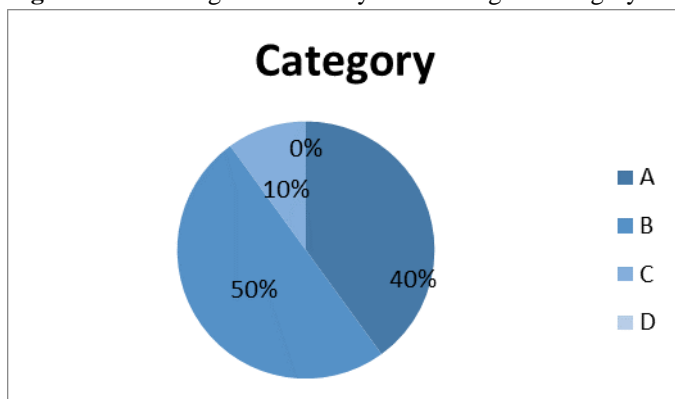
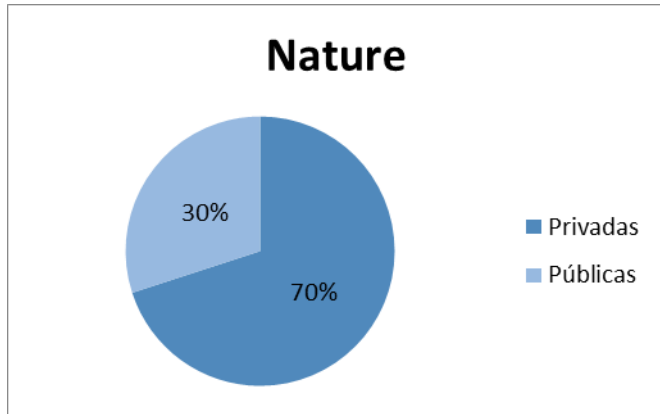


Figure 8. Percentages of usability considering the nature of the universities.



Compatibility: In

this parameter, 22 universities showed that they are compatible in carrying out the tests with browsers that are currently popular, obtaining the maximum score of 10. Forty-one percent of the 22 universities belong to category B as seen in **Figure 9**. Private universities dominate in **Figure 10** with 59%.

Figure 9. Percentage of compatibility considering the category of the universities

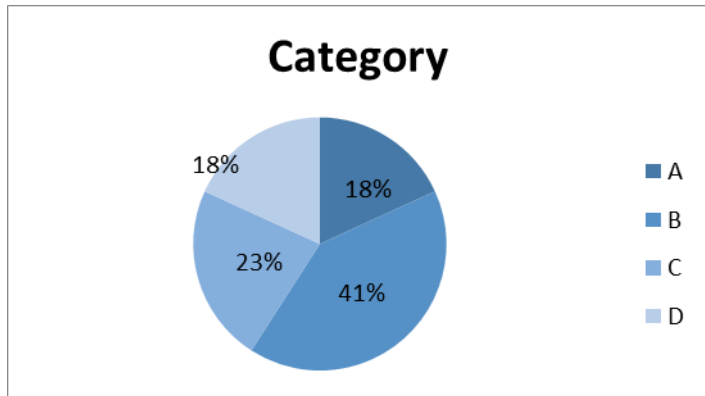
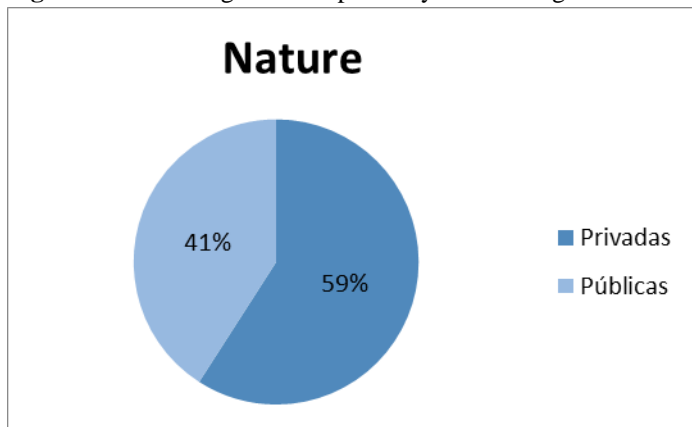


Figure 10. Percentages of compatibility considering the nature of the universities.



Positioning: This parameter analyzed the domain authority criteria (traffic estimates, Moz ranking, backlinks, domain authority) and basic SEO (www redirect, title, description, robots, sitemap, URL's friendliness). **Table 6** shows the results for this parameter and, in **Figure 11**, we can observe that 70% of these universities are currently in category B. **Figure 12**, on the other hand, shows that 60% of the top ten universities are private.

Table 6. Positioning Top ten.

#	University (Category – Nature)	SEO authority Total	Basic SEO Total /10	Total Positioning
1	Universidad Politécnica Salesiana (B – Private)	9,6363	10	9,8192
2	Escuela Superior Politécnica del Litoral (A – Public)	9,6315	10	9,8157
3	Escuela Politécnica Nacional (A – Public)	9,4588	8,75	9,1044
4	Universidad de las Américas (B – Private)	8,1861	10	9,0930
5	Universidad Central del Ecuador (B – Public)	8,5382	8,75	8,6441
6	Universidad Internacional del Ecuador (B – Private)	6,8242	10	8,4121
7	Universidad Casa Grande (B – Private)	6,2872	10	8,1436
8	Universidad Técnica Particular de Loja (B – Private)	10	6,25	8,1250
9	Universidad Nacional de Loja (B – Public)	7,5805	7,5	7,5402
10	Universidad Regional Autónoma de los Andes (C – Private)	6,0378	7,5	6,7689

Figure 11. Percentages of positioning considering the category of the universities.

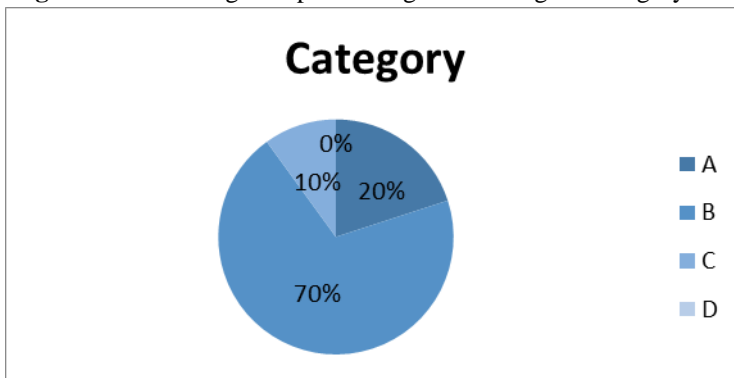
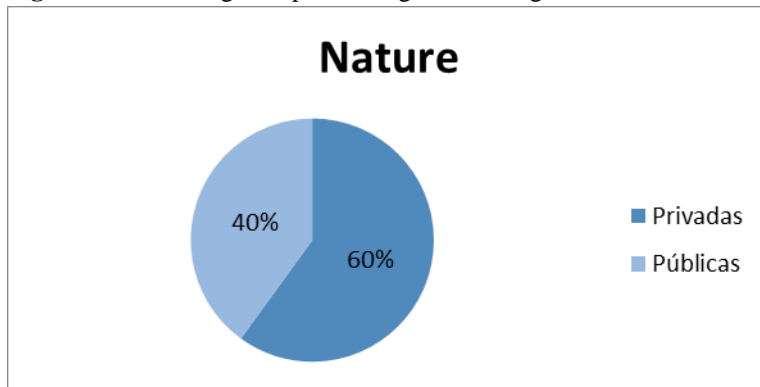


Figure 2 Percentages of positioning considering the nature of the universities.



Ranking

Table 7 summarizes the results of the evaluation to the universities, generating a ranking of website quality.

Table 7. Overall Ranking

#	University	Score	#	University	Score
1	Universidad de las Américas	9,0127	2	ESPOL - Escuela Superior Politécnica del Litoral	8,7454
3	Universidad de Especialidades Espíritu Santo	8,6167	4	Universidad Internacional del Ecuador	8,4306
5	USFQ - Universidad San Francisco de Quito	8,4135	6	Universidad Técnica de Cotopaxi	8,3437
7	Universidad Regional Autónoma de los Andes	8,2404	8	Universidad Iberoamericana	8,1767
9	Universidad Tecnológica Israel	8,1413	10	Universidad Politécnica Salesiana	8,0649
11	Universidad de los Hemisferios	8,0371	12	EPN - Escuela Politécnica Nacional	7,9377
13	Universidad de Cuenca	7,8747	14	Universidad Tecnológica ECOTEC	7,8593
15	Universidad Estatal Península de Santa Elena	7,7942	16	Universidad Católica de Santiago de Guayaquil	7,6220
17	Universidad Central del Ecuador	7,5149	18	Universidad Nacional de Loja	7,3416
19	Universidad Técnica de Manabí	7,3329	20	Universidad Tecnológica Equinoccial	7,1450
21	Universidad Politécnica del Carchi	7,1353	22	Universidad Técnica Particular de Loja	7,0957
23	Universidad Estatal Amazónica	6,9542	24	Universidad del Pacífico Escuela de Negocios	6,9501
25	Universidad Agraria del Ecuador	6,9354	26	Universidad Católica de Cuenca	6,9329
27	Universidad Estatal de Milagro	6,9014	28	Universidad Particular Internacional SEK	6,8671
29	Universidad Técnica de Ambato	6,8372	30	Universidad Casa Grande	6,8354
31	Universidad de Especialidades Turísticas	6,8296	32	Universidad Metropolitana	6,8000

33	Universidad Técnica Estatal de Quevedo	6,7598		34	Universidad Técnica Luis Vargas Torres de Esmeraldas	6,7328
35	Universidad Estatal del Sur de Manabí	6,7099		36	Universidad Tecnológica Indoamérica	6,6041
37	Universidad Laica Eloy Alfaro de Manabí	6,6019		38	Universidad Técnica de Machala	6,5096
39	Universidad del Azuay	6,5019		40	Universidad Estatal de Bolívar	6,5005
41	Universidad de Guayaquil	6,3559		42	Escuela Superior Politécnica Agropecuaria de Manabí	6,3386
43	Universidad Técnica del Norte	6,2759		44	Escuela Superior Politécnica del Chimborazo	6,1311
45	Universidad Laica Vicente Rocafuerte de Guayaquil	6,0312		46	Universidad Nacional del Chimborazo	5,7362
47	Universidad Particular San Gregorio de Portoviejo	5,5875		48	Pontificia Universidad Católica del Ecuador	5,4238
49	Universidad de Otavalo	5,3310		50	ESPE - Universidad de las Fuerzas Armadas	5,2516
51	Universidad Tecnológica Empresarial de Guayaquil	5,2336		52	Universidad Técnica de Babahoyo	5,1789

In all the top ten, private universities predominated with an average of 80%, and in agreement with their categorization, universities in category B represented the 56%. When evaluating their functionality, 46.15% of the universities obtained a score higher than 9. This result indicates that almost half of the websites complied with this parameter. Regarding efficiency, 16 universities were on the recommended average score, which is 72%. It means that 30.77% of the university sites was above the recommended average score for this parameter. The portability parameter showed that most universities met the minimum and basic conditions required by this parameter. A small percentage (15.38%) of the universities fully complied with the recommendations and basic techniques to achieve a good positioning within search engines. In the compatibility parameter, it is evident that most university websites did not have difficulties when accessing from any browser and in any of the operating systems. In general, by averaging the scores of all the evaluation parameters of the 52 universities in Ecuador, it indicated that the best-scored parameter is the Compatibility, with an average rating of 8.7820 and the lowest one is the Portability parameter, with an average of 5.7757. From the results obtained, we suggest that universities use a content management system. Such systems are up to date with the latest web trends, compliance of standards, improvement of their upload speed, utilization of frameworks that adjust the website to different screens, simple SEO setups, and other features.

CONCLUSIONS

- Six web quality assessment parameters, each with their respective criteria, were determined based on the international standards ISO / IEC 2510 and the W3C.
- Out of the 28 analyzed tools, the eight that best fit the parameters and established criteria were selected. Manual checks were performed on the parameter Usability, Portability as well as in the Redirection, Title, and Description of Basic SEO criteria for the Positioning parameter.
- The ranking was generated by weighting the proposed parameters equitably.
- By using this information, administrators of university web services will be able to improve their websites to make them more inclusive, accessible, and with better positioning worldwide.
- With defined parameters and tools one can work on the development of an online system, in real time, and free of charge to monitor websites of governmental entities.

REFERENCES

- Afilias Technologies. (2016). Ready mobi. Retrieved from <http://ready.mobi/>
- Benigni, G., Ordaz, J. A., Gervasi, O., & Pallottelli, S. (2011). USABILIDAD ÁGIL Y REINGENIERÍA DE SITIOS WEB : USABAGLEWeb. *Revista Multidisciplinaria Del Consejo de Investigación de La Universidad de Oriente*, 23, 51–61. Retrieved from <http://www.redalyc.org/articulo.oa?id=427739445009>
- Bermúdez Tamayo, C., Jiménez Pernet, J., Francisco García Gutiérrez, J., Azpilicueta Cengotitobengoa, I., Silva Castro, M. M., Babio, G., & Plazaola Castaño, J. (2006). Cuestionario para evaluar sitios web sanitarios según criterios europeos. *Atención Primaria*, 38(5), 268–274. <https://doi.org/10.1157/13092985>
- Beyond Security Inc. (2016). Test the Security of Your Website or Blog - Free. Retrieved from <https://www.scanmyserver.com/>
- CEAACES. (2016). Acreditación y categorización. Retrieved from <http://www.ceaaces.gob.ec/sitio/acreditacion-y-categorizacion/>
- Díaz Campo, J. (2014). Las cadenas de televisión españolas en Internet : un estudio sobre la calidad de sus sitios web. *Estudios Sobre El Mensaje Periodístico*, 20, 67–83.
- García Fernández, J. M. (2013). Situación actual de los sitios web de las bibliotecas de la unam. *Biblioteca Universitaria*, 16, 109–122. Retrieved from <http://www.redalyc.org/articulo.oa?id=28529572003>
- Gobierno Electrónico. (2014). Gobierno Electrónico. Retrieved from <http://www.gobiernoelectronico.gob.ec/gobierno-electronico/>
- González López, Ó. R., Bañegil Palacios, T. M., & Buenadicha Mateos, M. (2013). El índice cuantitativo de calidad web como instrumento objetivo de medición de la calidad de sitios web corporativos. *Investigaciones Europeas de Direccion Y Economia de La Empresa*, 19, 16–30. <https://doi.org/10.1016/j.iedee.2012.07.004>
- GT.net. (2017). Analyze your site's speed and make it faster. Retrieved from <https://gtmetrix.com/>
- HubSpot. (2017). HOW STRONG IS YOUR WEBSITE? Retrieved from <https://website.grader.com/>
- ISO. (2016a). ISO/IEC 25010. Retrieved August 29, 2016, from <http://iso25000.com/index.php/normas-iso-25000/iso-25010>
- ISO. (2016b). Sobre ISO. Retrieved from <http://www.iso.org/iso/home/about.htm>
- Jatmiko Suwawi, D. D., Darwiyanto, E., & Rochmani, M. (2015). Evaluation of academic website using ISO/IEC 9126. *3rd International Conference on Information and Communication Technology, ICoICT 2015*, 222–227. <https://doi.org/10.1109/ICoICT.2015.7231426>
- Melo Alves, F. M., & Quiroa Herrera, M. L. (2007). Análisis y evaluación de sitios Web de bibliotecas nacionales: los casos de Brasil y de Portugal. *Revista Española de Documentación Científica*, 30(2), 199–217. <https://doi.org/10.3989/redc.2007.v30.i2.379>
- Metricspot. (2017). Herramientas de Análisis Web y Auditoría SEO. Retrieved from <https://metricspot.com/es/>
- Microsoft. (2016). Browser screenshots. Retrieved from <https://developer.microsoft.com/en-us/microsoft-edge/tools/screenshots/>

- Molina, M. P., Luis, J., Berrocal, A., Cordon García, J. A., Marcial, V. F., Figuerola, C. G., ... Doucet, A.-V. (2004). ANÁLISIS CUALITATIVO DE LA VISIBILIDAD DE LA INVESTIGACIÓN DE LAS UNIVERSIDADES ESPAÑOLAS A TRAVÉS DE SUS PÁGINAS WEB. *Revista Española de Documentación Científica*, 27(3), 345–370.
- Moz. (2017). Moz. Retrieved from <https://moz.com/products/pro/se-toolbar>
- Olvera, M. D., & Aguilar Soto, M. (2011). Los sitios web académicos con información de postgrado herramientas para su evaluación. *INVESTIGACIÓN BIBLIOTECOLÓGICA*, 25, 31–57.
- Pérez, C. F., & González Mateos, I. (2013). Modelos para evaluar la situación de las bibliotecas escolares y la calidad de sus sitios web. *INVESTIGACIÓN BIBLIOTECOLÓGICA*, 28, 29–50.
- Rodríguez Martínez, R., Codina, L., & Pedraza Jiménez, R. (2012). Indicadores para la evaluación de la calidad en cibermedios: análisis de la interacción y de la adopción de la Web 2.0. *Revista Española de Documentación Científica*, 35(1), 61–93. <https://doi.org/10.3989/redc.2012.1.858>
- Universidad de Illinois. (n.d.). Functional Accesibily Evaluator 2.0. Retrieved from <https://fae.disability.illinois.edu/anonymous/?AnonymousReport=/>
- W3C. (2016). Sobre el W3C. Retrieved from <http://www.w3c.es/Consortio/>
- World Wide Web Consortium. (2015a). Markup Validation Service. Retrieved from <https://validator.w3.org/>
- World Wide Web Consortium. (2015b). Unicorn - Validador Unificado del W3C. Retrieved from <https://validator.w3.org/unicorn/>

Examining the Relationship Between Tendency of Reflective Thinking and Reflection Abilities of Physical Education and Sports Teachers

Adem SOLAKUMUR

*Bartın University, School of Physical Education and Sports,
Bartın, TURKEY
asolakumur@bartin.edu.tr*

Murat KUL

*Bartın University, School of Physical Education and Sports,
Bartın, TURKEY
muratkul@bartin.edu.tr*

Glten HERGNER

*Sakarya University Faculty of Sports Sciences,
TURKEY
herguner@sakarya.edu.tr*

ABSTRACT

The purpose of this study was to examine the relationship between tendency of reflective thinking and reflection abilities of physical education and sports teachers and find out whether there was a significant difference regarding gender and job experience. The importance of the study is that the results of the scale applied on the physical education and sports teachers will be an example for other studies and provide support on the point of the necessity that physical education and sports teachers should reflect their reflective thinking and reflection abilities on education. Relational screening model that is one of the descriptive screening models was applied on the focus group which was chosen via random sampling method. 256 randomly-selected, voluntary ones out of 460 physical education and sports teachers in Sakarya province participated in the study which was carried out in 2015-2016. Scale of Tendency of Reflective Thinking in Physical Education and Sports Teachers (YANDE) developed by Semerci (2007) and Groningen Reflection Skill Scale developed by Aukes et al. (2007) and translated into Turkish by Elaldı (2013) were used in the study to gather data. Whether there was a significant relationship between YANDE and Reflection Skill score means were examined via correlation analysis and the results showed that there was a positively significant relationship between YANDE score means and Reflective Thinking score means ($p>0.05$). According to gender variable regarding YANDE and Reflection Skill score averages, there was no significant difference except for Open-mindedness sub-dimension of YANDE ($p>0.05$) and Reflection Skill score means ($p>0.05$). Besides, there was no difference between Reflection Skill and score means ($p>0.05$). YANDE and Reflection Abilities score means were examined according to the variable of job experience and the results were significantly different and statistically in favor of teachers with 1-10 years' experience in YANDE in total ($p<0.05$) and in sub-dimensions of "Constant and Purposed Thinking" ($p<0.05$) and "Open-mindedness" ($p<0.05$). Additionally, there was a statistically significant difference between the 11-20 years group in Reflection Skill score means ($p<0.05$).

INTRODUCTION

It is an undeniable fact that education is an obligation of life for today's and future generation and has the power to build a world. The issue of education is both a universal and a national one. For the humanity to dispose of the crisis it is in today, build world peace and meet on a common ground, it is essential that countries hold the principles of universal education above their national profits and intimately believe in it.

According to Semerci (1999), the developing and changing world conditions make it necessary to be an individual who can make oneself known. Only the ones who think, namely use their higher level cognitive skills will be more successful in the future according to Semerci (1999). Therefore he indicates the importance of education by saying, “This makes itself known as an obligation today and in the future.” We can do that by developing multiple skills and knowledge of the educators. It is a necessity to examine the extent of the impact of the relationship between the tendency of reflective thinking and reflection abilities of the educators. Therefore, reflection and reflective thinking and how it is used are the focus of this study.

According to Gagnon and Collay (2001, p.29-50; cited in Semerci, 2007), Reflection is teachers’ revealing their own thoughts, attitudes and skills while explaining a subject. Lipman (2003) defines reflective thinking as being aware of one’s thoughts and actions, and able to think of the cause and effects of them. Besides, he indicated that reflective thinking is individual paying attention to her/his own methods and perspectives. According to Dewey (1933), reflective thinking is a type of thinking which involves considering a topic in the mind and evaluating it in a serious way. While stating the essentials of reflective thinking, Duban and Yelken (2010) state “gaining right ways of thinking will profit students in using information, problem solving, being successful in daily life and school.” In order to equip students with these skills, firstly the teachers should have reflective thinking skills and constantly use and improve them.

Considering the explanations above, this study is important with regards to examining the relationship between tendency of reflective thinking and reflection abilities of physical education and sports teachers and whether the variables of gender and job experience are a factor on tendency of reflective thinking of physical education and sports teachers.

The hypotheses about the situations stated are given below.

H1: There is a significant difference between physical education and sports teachers’ reflection abilities score mean and Tendency of Reflective Thinking (YANDE) score means regarding the gender variable.

H2: There is a significant difference between physical education and sports teachers’ Reflection Abilities score means and Tendency of Reflective Thinking (YANDE) score means regarding the variable of job experience.

H3: There is a significant relationship between physical education and sports teachers’ Reflection Abilities score means and Tendency of Reflective Thinking (YANDE) score means.

METHOD

Topic of the Study

The topic of the research is to reveal the relationship between Reflective Thinking Tendencies and Reflection Abilities of physical education and sports teachers who work at various education institutions in Sakarya province using relevant scales.

Model of the Study

In this study which examines the relationship between the Reflective Thinking Tendencies and Reflection Abilities of physical education and sports teacher who work at various education institutions in Sakarya province, relational screening model which is one of the descriptive screening models was used.

Preparation of the Scale Form and Data Collection Method

Scale was used as a data gathering method in the study. The scale form was composed of three sections. The first section of the scale form was comprised of the “Personal Information Form” which included gender and job experience variables. The second section of the scale form included “Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE)” with statements to determine the physical education and sports teachers’ Reflective Thinking Tendencies. The third form of the scale involved “Groningen Reflection Skill Scale” with statements to determine the physical education and sports teachers’ Reflection Abilities.

Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE)

“Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE)” which was developed by Semerci (2007) was used to determine the opinions of the physical education and sports teachers in Sakarya province regarding Reflective Thinking Skills (RT). Necessary permission to use the scale was received. The scale included 20 negative and 15 positive, 35 items in total. The Cronbach Alpha value of internal consistency of this YANDE scale was calculated as 0.916. The negative items in the scale were 1,4,6,8,9,10,11,12,13,14,15,16,17,18,20,22,26,28,31,34; and the positive items were 2,3,5,7,19,21,24,25,27,29,30,32,33,35. 35 items of 7 sub-dimensions regarding Constant and intentional thinking, Open-mindedness, Critical and Effective Teaching, Responsibility of Teaching and Being Scientific, being Inquisitive, Visionary and Sincere, Perspective on the Job. The scale was Likert-type. The rating of the scale was Completely Agree (5), Mostly Agree (4), Partially Agree (3) Mostly Disagree (2) Completely Disagree (1).

The Groningen Reflection Ability Scale (GRAS)

The Cronbach Alpha value of internal consistency of the Groningen Reflection Ability Scale which was developed in Dutch by Aukes et al. (2007) was calculated as 0,795. The Groningen Reflection Ability Scale was adapted into Turkish by Elaldı (2013) with 10 positive (1,2,3,4,5,6,7,8,10,11) and 1 negative (9) items. It was a 5-rate Likert type scale with ratings such as Completely agree (5), Mostly Agree (4) Partially Agree (3), Disagree (2) and Completely Disagree (1). The focus of this scale was on self-reflection (I know my thinking habits well), empathetic reflection (I am aware of the possible emotional impacts of my opinions of others) and reflective communication (I am open to discuss my own ideas).

Creating the Population Frame and Sample

The population of this study was comprised of 460 physical education and sports teachers who worked at various education institutions in 2015-2016 in Sakarya province. Since it was not possible to reach all of the population, physical education and sports teachers were chosen via simple random sampling method. “YANDE” and the “Groningen Reflection Ability” scales were applied to the 176 male, 80 female 256 physical education and sports teachers in Sakarya in total.

Data Collection and Analysis

After necessary permissions were received from the Directorate of National Education in Sakarya, the scale form was filled by the teachers in the presence of the researcher. The data were analyzed on computer via SPSS (Statistical Package for Social Sciences) 24.0 package program. Considering the data were normally distributed, suitable tests were chosen in the analysis. In descriptive data analysis, frequency, percentage, mean, standard deviation calculations were used. In order to examine the levels of “Reflective thinking” and “Reflection Abilities” of the teachers according to some variables, T test and ANOVA test which are parts of parametric tests were used. Additionally, correlation analysis was used in examining the direction and magnitude of the relationship between the scales. The analysis and findings were interpreted according to the $p < 0.05$ significance level.

FINDINGS

In this section of the study, information and explanations about the findings of the study are presented. The study includes findings and interpretations regarding the teachers’ “Reflection Abilities” and “Reflective Thinking Tendencies” according to the “gender and job experience” variables.

Table1. Frequency and Percentage Distribution Results of the Study Group according to the Gender and Job Experience Variables

Variables	Sub-groups of the variables	n	Total (n)	%	Total (%)
Gender	Male	176	256	68,8	100,0
	Female	80		31,3	
Job experience	1-10 years	140	256	47,3	100,0
	11-20 years	98		34,4	
	21 years and above	18		18,4	

256 participants who formed the study group according to the gender variable were comprised of 176 male and 80 females. The highest frequency was between “1-10 years” and the lowest frequency was “21 years and above” according to the job experience variable.

Table2. T Test Results of the Study Group regarding the Sub-Dimensions of Reflection Abilities and Reflective Thinking Tendency according to the Gender Variable

	Gender	n	Mean	Sd	Sd.	t	p
Constant and Intentional Thinking	Female	80	3,79	,59	254	,993	,322
	Male	176	3,70	,71			
Open-mindedness	Female	80	4,37	,64	254	2,097	,037
	Male	176	4,17	,72			
Critical and Effective Teaching	Female	80	4,43	,61	254	1,165	,245
	Male	176	4,33	,63			
Teaching Responsibility and Being Scientific	Female	80	3,85	,82	254	,115	,909
	Male	176	3,84	,91			
Inquisitive	Female	80	3,76	,83	254	-,191	,848
	Male	176	3,78	,82			
Being Visionary and Sincere	Female	80	3,87	,95	254	,325	,745
	Male	176	3,83	,92			
Perspective on the Job	Female	80	4,12	,93	254	-,349	,727
	Male	176	4,17	,89			
YANDE Mean	Female	80	4,01	,53	254	,896	,371
	Male	176	3,94	,56			

Reflection Ability	Female	80	4,06	,44	254	,427	,670
	Male	176	4,04	,48			

There was not a statistically significant difference on the results of the t-test which was applied to compare the score means of “Reflection Abilities” according to the gender variable ($p>0.05$). There was a statistically significant difference on the results of the t-test which was applied to compare the score means of the sub-dimension of “Open-mindedness” of YANDE [$T(254)=$, 2,097; $p<0.05$]. However, there was not a statistically significant difference between the results of other sub-dimensions of YANDE and total score means ($p>0.05$).

Table3. ANOVA Results regarding the Sub-dimensions of Reflection Ability and Reflective Thinking Tendency of the Study Group according to the Job Experience Variable

Alt Boyutlar	Resource of the Variance	Total of the Squares	sd	Means of the Squares	F	p	Significant Difference
Constant and Intentional Thinking	Among the groups	4,783	2	2,391	5,427	,005	1-10 years >21 years and above
	In the Groups	111,481	253	,441			
	Total	116,264	255				
Open-mindedness	Among the Groups	5,991	2	2,995	6,319	,002	1-10years >11-20 years and above
	In the Groups	119,936	253	,474			
	Total	125,927	255				
Critical and Effective Thinking	Among the Groups	1,085	2	,543	1,399	,249	
	In the Groups	98,148	253	,388			
	Total	99,234	255				
Teaching Responsibility and Being Scientific	Among the Groups	4,494	2	2,247	2,946	,054	-
	In the Groups	193,003	253	,763			
	Total	197,498	255				
Inquisitive	Among the Groups	3,037	2	1,518	2,276	,105	-
	In the Groups	168,796	253	,667			
	Total	171,833	255				
Being Visionary and Sincere	Among the Groups	1,761	2	,881	1,016	,364	-
	In the Groups	219,364	253	,867			
	Total	221,125	255				

Perspective on the Job	Among the Groups	2,118	2	1,059	1,301	,274	-
	In the Groups	206,037	253	,814			
	Total	208,155	255				
YANDE Means	Among the Groups	3,047	2	1,523	5,202	,006	1-10years>21 years and above
	In the Groups	74,098	253	,293			
	Total	77,145	255				
Reflection Ability	Among the Groups	1,305	2	,652	3,025	,050	11-20 years > 21 years and above
	In the Groups	54,563	253	,216			
	Total	55,868	255				

There was a statistically significant difference in the sub-dimensions of “Constant and Intentional Thinking” ($F(2-255)= 5,42$; $p<0.05$), “Open-mindedness” ($F(2-255)= 6,32$; $p<0.05$) and YANDE means ($F(2-255)= 5,20$; $p<0.05$) according to the job experience variable. According to the Post Hoc tests, the difference was in support of the teachers with an experience of 1-10 years. Additionally, there was a statistically significant difference between the score means of Reflection Ability ($F(2-255)= 3,02$; $p<0.05$). According to the Post Hoc tests, this difference was in support of the teachers with an experience of 11-20 years.

Table4. Correlation Test Results regarding the Sub-dimensions of Reflective Thinking Tendencies and Reflection Abilities of the Study Group

	YANDE Mean	Const. and Int. Thinking	Open-mindedness	Crit. And Effective Thinking	Teaching Resp. and Being Scientific	Inq.	Being Visionary and Sincere	Perspe ctive on the Job
Reflection Ability	r	,314**	,174*	,143*	,228**	,279**	,244**	,292**
	p	,000	,005	,022	,000	,000	,000	,001
	n	256	256	256	256	256	256	256

When the relationship between the Reflective Thinking Tendencies and Reflection Abilities of the study group was examined, a positively significant correlation was found between “Reflection Ability”, “Constant and Intentional Thinking” which is one of the sub-dimensions of YANDE [$r = ,174$; $p<0,05$], “Open-mindedness” [$r = ,143$; $p<0,05$], “Critical and Effective Teaching” [$r = ,228$; $p<0,05$], “Teaching Responsibility and Being Scientific” [$r = ,279$; $p<0,05$], “Inquisitive” [$r = ,244$; $p<0,05$], “Being Visionary and Sincere” [$r = ,292$; $p<0,05$] and “Perspective on the Job” [$r = ,213$; $p<0,05$] and YANDE means [$r = ,314$; $p<0,05$].

DISCUSSION AND CONCLUSION

In this section which includes discussion, conclusion and suggestions, the analysis results regarding the data of the sub-problems of the study. Results of the statistical data regarding the score means of Reflection Ability and YANDE sub-dimensions (Constant and Intentional Thinking, Critical and Effective Teaching, Teaching Responsibility and Being Scientific, Inquisitive, Being Visionary and Sincere, Perspective on the Job) according to gender and job experience variables of the physical education and sports teachers are presented below.

There was not a statistically significant difference in the results of the t-test regarding the “Reflection Abilities” and YANDE score means of the study group according to the gender variable ($p>0.05$). However, there was a statistically significant difference in the results of the t-test regarding the comparison of the score means of the sub-dimension of “Open-mindedness” [$T(254)= 2,097$; $p<0.05$]. According to this, while male physical education and sports teachers were more open-minded than female physical education and sports teachers; there was not a significant difference in the other six sub-dimensions.

According to the studies of Durdukoca and Demir (2012), Şahin (2011), Ergüven (2011) and Dolapçioğlu (2007), there was not a significant difference in the answers of male and female teachers to the sub-dimensions of reflective thinking tendency. So, reflective thinking tendencies did not change according to gender. Saygılı and Tehnedere (2014) did not find a statistically significant difference between the score means regarding the sub-dimensions of YANDE scale according to gender, education level and marital status of the education staff. Similarly, in Gedik, Akhan and Kılıçoğlu’s (2014) study revealed that there was not a significant relationship in 3rd and 4th grade social sciences teacher candidates’ reflective thinking tendencies according to their gender, family income and type of high school. These results also match with the results of the present study which reveals that there is not a significant relationship between the teachers’ reflection abilities, their YANDE score means and YANDE sub-dimensions (except for the sub-dimension of open-mindedness).

There was a significant difference between the YANDE mean and sub-dimensions of “Constant and Intentional Thinking” ($F(2-255)= 5,42$; $p<0.05$) and “Open-mindedness” ($F(2-255)= 6,319$; $p<0.05$), according to the job experience variable. The results were in support of the teachers with job experience of 1-10 years in the Post Hoc Tests. Besides, there was a statistically significant difference ($F(2-255)= 3,02$; $p<0.05$) between the Reflection Ability score means. This difference was in support of the teachers with job experience of 11-20 years. There are similar data in other studies. Hasırcı and Sadık (2011) found that teachers’ gender, marital status and education level were not factors that affect their reflective thinking abilities; however, their job experience, type of school and socio-economical features of the schools were the factors that affected teachers’ reflective thinking abilities.

When the relationship between the Reflective Thinking Tendencies and Reflection Abilities of the study group was examined, there was a positively significant relationship between the “Reflection Ability” and YANDE sub-dimensions of “Constant and Intentional Thinking” [$r = ,174$; $p<0,05$], “Open-mindedness,” [$r = ,143$; $p<0,05$], “Critical and Effective Teaching” [$r = ,228$; $p<0,05$], “Teaching Responsibility and Being Scientific” [$r = ,279$; $p<0,05$], “Inquisitive” [$r = ,244$; $p<0,05$], “being Visionary and Sincere” [$r = ,292$; $p<0,05$] and “Perspective on the Job” [$r = ,213$; $p<0,05$] and YANDE mean [$r = ,314$; $p<0,05$]. Therefore, as reflective thinking tendencies of the physical education and sports teachers increase, their reflection abilities also increased.

In his study, Karadağ (2010) found that the reflective thinking levels of social sciences teachers were quite high and their most positive perception regarding the reflective thinking abilities was in the dimension of “Open-mindedness”. In a similar study, Meral and Semerci (2009), aimed to determine critical and reflective thinking of primary school teachers of English. Results of the study revealed that while teachers of English generally thought reflectively, they partially thought reflectively in the sub-dimensions of perspective on the job and constant and intentional thinking.

These results match with the finding of the present study regarding a statistically positive and significant relationship between Reflective Thinking Tendencies and Reflection Abilities score means.

SUGGESTIONS

These suggestions can be made in accordance with this study:

- In-service educations can be given to the physical education teachers in order to improve their Reflective thinking tendencies and reflection abilities and allow them to use them actively.
- Also, related compulsory classes can be included in the curriculum of the undergraduate programs that train teachers.
- Preparatory, improving and executive education regarding reflective thinking tendencies and reflection abilities of teacher candidates can be included in the training program.
- Other scientific studies which will raise awareness on the subject of the necessity that physical education and sports teachers should think reflectively and use reflection abilities actively while conveying their skills and information can be conducted.

REFERENCES

- Aukes, L. C., Geertsma, J., Cohen-Schotanus, J., Zwierstra, RP, Slaets J. P. J. (2007). The development fascale to measure Personal Reflectionin Medical Practiceand Education. *Medical Teacher*, 29, 177–82.
Downloaded from <https://scholar.google.com.tr/> on 26 October 2016.
- Dewey, J. (1933). *How we think: restatement of the relation of reflective thinking to the educative process*. Boston: D. D. Heath.
- http://www.naturalthinker.net/trl/texts/Dewey,John/Dewey,_John_Democracy_And_Education.pdf Downloaded on 2 September 2016.
- Dolapçıoğlu, S.D. (2007). *Evaluating the Reflective Thinking Levels of Primary School Teachers*. MA Thesis, Mustafa Kemal univeristy, Institute of Social Sciences, Hatay.
- Duban, N. ve Yelken T.Y. (2010). Views of Teacher Candidates regarding Reflective Thinking Tendencies and Reflective Teacher Features. *Çukurova University. Institute of Social Sciences Journal*, 2,343 – 336.
- Durdukoca, Ğ. ve Demir, M. (2012). İlköğretim öğretmenlerin bazı değişkenlere göre yansıtıcı düşünme düzeyleri ve düşüncelerindeki öğretmen niteliklerinin yansıtıcı öğretmen niteliklerine uygunluğu. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 20, 357-374.
- Elaldı, G. (2013). Yansıtıcı düşünme etkinlikleri ile destekli tam öğrenme modelinin tıp fakültesi öğrencilerinin üstbiliş becerileri, öz-düzenleme stratejileri, öz-yansıtma becerileri, öz-yeterlik inançları, eleştirel düşünme becerileri ve akademik başarılarına etkisi. (Yayımlanmamış Doktora Tezi). Fırat Üniversitesi, Elazığ.
- Ergüven, S. (2011). Öğretmenlerin yansıtıcı düşünme becerilerinin çeşitli değişkenler açısından incelenmesi. Yüksek Lisans Tezi, Niğde Üniversitesi, Sosyal Bilimler Enstitüsü, Niğde.
- Gagnon, W. G.,&Collay, J. M. (2001). *Designing for learning: six elements in constructivist classrooms*. Thousand Oaks, California, USA: Corwin Press.
- Gedik, H., Akhan, N. ve Kılıçoğlu, G. (2014). Sosyal bilgiler öğretmen adaylarının yansıtıcı düşünme eğilimleri. *MediterraneanJournal of Humanities*, IV/2, 113- 130.
- Güvenç, Z. (2012). Sınıf öğretmenlerinin duygusal zekâları ile yansıtıcı düşünme becerileri arasındaki ilişki. Yüksek Lisans Tezi, Pamukkale Üniversitesi, Sosyal Bilimler Enstitüsü, Denizli.
- Hasırcı, K. Ö. Ve Sadık, F. (2011). Sınıf öğretmenlerinin yansıtıcı düşünme eğilimlerinin incelenmesi. *Ç.Ü. Sosyal Bilimler EnstitüsüDergisi*,20(2),195-210.
- Karadağ, M. (2010). Sosyalbilgiler öğretmenlerinin yansıtıcı düşünme düzeylerinin incelenmesi (Şanlıurfa ili örneği). (YayımlanmamışYüksekLisansTezi). Çukurova Üniversitesi, Adana.
- Lipman, M. (2003). *Thinking in Education*. Cambridge University Press. New York.
Downloaded from <https://books.google.com.tr/> on 14 October 2016.
- Meral, E. ve Semerci, Ç. (2009). Yeni (2006) İlköğretim İngilizce Programını Uygulayan Öğretmenlerin Eleştirel ve Yansıtıcı Düşünceleri,DoğuAnadoluBölgesiAraştırmaları, 8(1), 50–54.
- Saygılı, G. ve Tehnedere, S.(2014) Eğitim Çalışanlarının Yansıtıcı Düşünme Becerilerinin Çeşitli Değişkenler Açısından İncelenmesi,Mehmet Akif Ersoy Üniversitesi Sosyal Bilimler Enstitüsü DergisiYıl: 6 Sayı:11 2014 Güz (s. 192-202)
- Semerci, Ç., (1999). “Öğrencilerin Öğretmenlik Mesleğine İlişkin Tutum Ölçeği”, *Eğitim ve Bilim*, 23(111), 51-55.

- Semerci, Ç., 2007. Öğretmen ve öğretmen adayları için yansıtıcı düşünme eğilimi (YANDE) ölçeğinin geliştirilmesi. Kuram ve Uygulamada Eğitim Bilimleri 7 (3), 1351-1377.
- Semerci, Ç. (2007). Developing A Reflective Thinking Tendency Scale for Teachers and Student Teachers. Educational Sciences: Theory & Practice, 7(3), 1369-1376.
- Şahin, A. (2011). Türkçe öğretmeni adaylarının yansıtıcı düşünme eğilimlerinin çeşitli değişkenlere göre değerlendirilmesi. Elektronik Sosyal Bilimler Dergisi, 10(37), 108-119.

Exploring the Potential Relationships Between Teaching Materials and Student Motivation

Koji UENISHI

Institute for Foreign Language Research and Education

Hiroshima University, Japan

uenishi@hiroshima-u.ac.jp

ABSTRACT

This paper investigates the potential usefulness of original teaching materials in order to enhance Japanese university students' intrinsic motivation when learning English including cross-cultural understanding, usefulness, and pleasure. Specifically, Non-English-major students were taught English for one semester using the author's textbook, based on his own experiences overseas. Data analysis suggests that almost all students in the two classes examined enjoyed learning from the teaching materials, had a strong feeling of the importance of English learning, and had a strong awareness of developing English ability after studying each unit.

INTRODUCTION

With regard to English learning in tertiary education, we educators and researchers need to continually evaluate our approach. University students who will use English as a tool in society after graduation need to improve their English proficiency, which might lead to their increased motivation to learn English at university.

In general, however, students lack motivation to learn English on a bachelor program, most do not feel language learning to be meaningful. Most student motivation relates to credit gains for their general English classes. Especially, by the time they become sophomores, students' attitudes toward English study tend to become diverse; in fact, some students appear demotivated with regard to learning English and others are just losing interest in English. However, among sophomores some students have studied very seriously by setting TOEIC Test goals or developing their English proficiency in order to study abroad.

It appears vital for teachers to create a class to motivate English language students. In this paper, one useful method to overcome this is considered, while teaching students who are less motivated or demotivated into English learning, in order to help them discover the significance of studying English in class. An attempt is made to implant feelings of English usefulness and pleasure in learning English into the students via the use of original materials which might motivate students to learn the language.

EARLIER RESEARCH

There have been numerous studies on English learning motivation. Particular attention has been paid to intrinsic motivation and extrinsic motivation. These types of motivation are distinguished in self-determination theory (e.g., Deci & Ryan, 1985; and, Ryan & Deci, 2002). Intrinsic motivation is responsible for learners taking an interest in English learning and wanting to communicate with English speakers in English. Alternatively, extrinsic motivation, coming from external sources, leads to learners towards qualifications or passing examinations (Deci & Ryan, 1985). It is often said that such motivations do not conflict with each other, but form a diverse continuity (Lin, McKeachie, & Kim, 2003).

Some research on intrinsic motivation has been conducted by introducing presentations into group activities in class. As a result, enhancement of intrinsic motivation has been shown to be successful (e.g., Tanaka & Hiromori, 2007). Hayashi (2009) explores the relations of intrinsic and extrinsic motivations to learner activities by classifying learners into three groups based on their autonomy, concluding that regardless of their autonomy, learners have a tendency towards 'enjoyable' activities in class. Iwanaka (2011) confirms that it might be possible to enhance learner motivations toward class activities, English classes and English learning by satisfying three psychological needs of 'competence', 'relatedness' and 'autonomy'. The above was conducted in order to enhance intrinsic motivation through various learner activities.

Miura (2010) conducted a seven-year longitudinal research on students' learning motivation from junior high to university, and suggested that university students tend to feel less motivated with regard to language learning after entering university even though their motivation tended to increase at the third year of junior high and senior high schools.

Hamada's (2008) quantitative research on junior and senior high school students' awareness shows that *course books* were the strongest demotivator. Sakai and Kikuchi (2009) collected high school student learning motivation data and found three important motivation factors: *learning contents and materials, lack of motivation, and test scores*, especially for less motivated learners.

Tanaka (2009) conducted motivation research focusing on English learning materials, especially overseas dramas and movies, and likewise he found these to have the positive effect of enhancing intrinsic motivation. Use of DVDs has a great influence on motivation for learning English.

Based upon his data results, Hamada (2011) lists the following effective methods in preventing demotivation:

- (1) Practice listening by shadowing
- (2) Communicative tasks
- (3) Group/pair work
- (4) Less use of grammar translation style
- (5) Presentation
- (6) Teachers' uniqueness

The last category, *Teachers' uniqueness*, includes teachers' creative ideas such as their experiences abroad and their use of quizzes in English on current world news (Hamada, 2011). This category can be said to be related to the materials the teacher uses. When it comes to English reading class especially, the teaching content has a crucially important effect on student learning motivation.

OBJECTIVES

The current research investigates university students' intrinsic motivation to learn English and explores the extent to which the content of teaching materials is received favorably by non-English-major students, and the relationship between the original materials and student awareness of English learning. In particular, focusing on the four countries/areas introduced in class, learner affectivity about the content was compared and discussed. The specific research questions are:

- (1) To what extent are teaching materials favored by students?
- (2) Does learner awareness vary among teaching materials (amongst four countries or regions)?
- (3) How do students feel about the teaching materials?

METHODS

The subjects were 83 students who were not majoring in English (non-English major students). Students were divided into several classes, based on TOEIC Test scores, and the classes were taught using the author's original textbook, *Ryu's Misadventures Abroad*. Regarding the students' English levels, the average TOEIC scores of the classes was 389 (basic high level) and 486 (intermediate level) (out of a maximum 990 points).

In the reading class, the author's textbook based upon overseas experiences was introduced to enhance student motivation into English learning. At the end of each unit a questionnaire was administered to explore learner awareness on the teaching materials and language learning. To obtain answers from the subjects, the questionnaire used a 6-point Likert scale. The questionnaire items were classified into four categories based upon the content of each questionnaire. Then, the collected data were analyzed using Two-way ANOVAs and Pearson product-moment correlation. In the last item of the questionnaire the students were asked to freely describe impressive or interesting parts relating to the teaching content.

CLASS CONTENT

The research was designed to encourage students to take a greater interest in English learning, becoming more motivated to learn it, and enhancing their English proficiency through use of materials based on the teacher's traveling experiences, including 'misadventures'. The textbook introduced is the teacher's original, *Ryu's Misadventures Abroad*, which constitutes 24 chapters, covering eight countries or regions. However, as students have 15 classes in one semester, they could only cover 12 chapters (four countries or regions). Below are the nations or regions they read about, and some of the problems Ryu encountered:

China: The main character visits Beijing and appreciates Kyougeki (Chinese opera). He has a lot of difficulty understanding the content of it because it is explained in Chinese and the audience have to appreciate it looking at the English subtitle on the far-end screen. Also, he gives a presentation in English at the international conference for the first time, and is fatigued from reading his paper in front of an audience. After that, he goes back to his room at the hotel and gets ready for a bath. Then, he turns up the faucet in the bathroom to bathe. While waiting for the tub to be full of bath water, he starts to enjoy the TV. After a while he takes a nap with water running because of fatigue. As a result, he floods his hotel room with water and has to cope with the resultant problems.

Hawaii: The main character does the sightseeing on Oahu Island, such as pineapple fields and Waikiki Beach. He learns about history of the fields and he makes fun of his wife about her way of swimming. Also, at Pearl Harbor, one of the battlefields in World War II, he teaches his children about manners in places where there is a cenotaph on which the names of the war dead are engraved. Further, when climbing down the mountain on Oahu Island, the Diamond Head, he suffers from diarrhea and encourages himself to endure it, until he finally manages to get to the toilet at the foot of the mountain.

Sri Lanka: Before the civil war ends in the country, the main character visits the country to participate in an international conference. He looks at the severe situation of the strict security in the capital. On the city tour he knows the look of the city and the situation of the trains at Colombo Station in those days, and has a good time conversing with local people. Also, after the second day of the conference he joins the welcome party and enjoys eating and talking. However, he has food poisoning at night and suffers from diarrhea and vomiting. The next day he is dehydrated and taken to a hospital to see a doctor and he has to be in hospital.

Scotland: The main character goes to Edinburgh to attend a conference with other professors. He visits one of the professors who loves Japan and things Japanese, and he has a gorgeous dinner. When the conference starts, he is very moved to see one teacher practicing his presentation earnestly in the square. Also, he participates in the famous Tattoo Festival in Scotland and is overwhelmed by how big the festival is and how international and brilliant it is.

The following teaching methods were used in class.

- (1) Vocabulary check (10 words)
- (2) Reading the passages and checking phrases
- (3) Listening Section: Listening (4 questions)
- (4) Listening to the teacher's explanation
- (5) Reading comprehension (4 questions)
- (6) Speaking Section: Filling in the blanks in two dialogues
- (7) Doing role play using the above dialogues

Regarding the vocabulary check, students first check vocabulary. Then, they check not only the vocabulary in the section, but also difficult and unknown words in passages. Next, they read a slightly longer passage (800-1000 words). The passage comes with one or two photos, which hopefully can lower their resistance to reading the long text. If necessary, the teacher makes some comments on the photo(s) before reading.

With regard to the listening section in the passage, students listen to the CD and answer the questions. This type of longer text might be difficult for slow learners to read. Then, moving on to reading comprehension, students answer Japanese questions on the content of the passage in order to deeply understand it. Additional explanation

based upon the writer's actual experiences further motivates learners to have a more positive attitude towards English learning.

In another activity, students fill in blanks in the dialogues created based on the text, and after checking answers, they play the roles of Ryu and another person from the text. One aim of this activity is to deepen their understanding of the content while reading the passage again in order to fill in the blanks. The other aim is to enable them to have a 'virtual reality' experience of an overseas trip by doing the pair work activity as if they actually were Ryu traveling abroad.

The final section is a Speaking Section or a fill-in-the-blanks type in the conversation of the story. Based on the story content, the conversation between Ryu and Person A develops. In short, Regarding Ryu's overseas experience, Person A asks Ryu questions about it and Ryu answers the questions.

RESULTS AND DISCUSSION

RESEARCH QUESTION (1)

In this section RQ (1) "To what extent are the teaching materials favored by students?" is discussed. As for the responses to questionnaire items among all students, first several remarkable items in the questionnaire are described. The mean scores of Item 5 (English will be useful in the future), Item 11 (Vocabulary section was effective) and Item 13 (Reading comprehension was effective) showed very high numerical values, 5.27, 5.08, and 5.04 on the 6-point Likert scale, respectively. Among the items, Items 11 and 13 belong to Category 4 (Effectiveness of questions) and these very high numerical values show how useful the questions to understand the texts, along with the other two ones (Items 12 and 14).

Also, the mean value of Item 6 (I came to want to develop comprehensive English ability better) was very high, 4.95. This means that many students had a strong awareness of developing English ability after finishing each unit. These results imply that the teaching materials including the writer's troubles while traveling abroad motivated them to learn English and urged them to understand the textbook using the questions, and that they feel how useful English is through the English classes.

Table 1: Descriptive Analysis

Class	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE</i>
E	38	4.793	.683	.055
BS	45	4.623	.688	.051

E: Education; BS: Combined Faculties

Table 2: Total responses to questionnaire items (Mean scores)

	1	2	3	4	5	6	7
<i>M</i>	4.53	4.77	4.37	4.42	5.27	4.95	4.67
	8	9	10	11	12	13	14
<i>M</i>	4.79	3.99	4.68	5.08	4.67	5.04	4.66

To reiterate, the questionnaire items were classified into four categories based upon the content of each questionnaire (Table 3), and the relationship among the categories was analyzed using Pearson product-moment and discussed (see Table 5).

Table 3: Classification of Items

	Classification	Item
C1	Cross-cultural understanding	1, 2
C2	Motivation into English learning	3, 4, 6
C3	Pleasure of textbook content	7, 8, 10
C4	Effectiveness of Questions	11, 12,

13,14

Table 4: Descriptive analysis (Categories)

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE</i>
C1	83	4.649	.614	.067
C2	83	4.580	.731	.080
C3	83	4.714	.781	.086
C4	83	4.861	.597	.066

Table 5: Correlative relationship (Total)

	C1	C2	C3	C4
C1	1	.514**	.710**	.362**
C2		1	.715**	.445**
C3			1	.424**
C4				1

** $p < .01$; * $p < .05$

Reliability amongst the whole data were relatively high, since the range of Cronbach's Alpha was from .911 to .784. Therefore, for all the scales, reliability is considered acceptable. Table 4 shows that the mean scores of four categories are higher than 4.5 on the 6-point scale. This means that the teaching contents including questions on the texts are meaningful and useful for learner motivation and understanding the passages.

Table 5 demonstrates the strong correlation between Category 3 (*Pleasure of textbook content*) and two other categories: Category 1 (*Motivation into English learning*) and Category 2 (*Cross-cultural understanding*). These results suggest that learner awareness of the enjoyment of reading the passages in the textbook relates to their positive attitudes toward learning English and understanding of foreign cultures. In short, there is possibility that when the teacher provides students with interesting textbook or the enjoyable content and they enjoy learning English, they might deepen their understanding of the content and are motivated into English learning. In addition, there is a moderate correlation between C1 and C2, indicating that understanding foreign cultures might relate to English learning motivation and that any incorporation of foreign cultures including overseas experiences into class might influence student motivation.

RESEARCH QUESTION (2)

In this section RQ (2) "Does learner awareness vary among teaching contents (four countries or regions)?" is discussed.

Table 6: Descriptive Analysis (Total)

Class	C	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE</i>
E	C1	38	4.813	.579	.094
E	C2	38	4.564	.798	.129
E	C3	38	4.945	.734	.119
E	C4	38	4.850	.557	.090
BS	C1	45	4.511	.616	.092
BS	C2	45	4.594	.678	.101
BS	C3	45	4.519	.773	.115
BS	C4	45	4.869	.635	.095

E: Education; BS: Combined Faculties

The two-way ANOVAs were conducted regarding learner awareness and classes, and the interactions between them were identified ($F(3)=6.227, p<.001$). In order to identify the differences among the groups, the data was analyzed using multiple comparison tests (Bonferroni).

The results indicate significant differences between the two groups regarding C1 (Cross-cultural understanding) and C3 (Pleasure of English learning), but there were no significant differences when it came to C2 (Motivation into English learning) and C4 (Effectiveness of questions). On the whole the higher mean scores of all categories show that learners tend to be highly motivated and enjoyed the teaching content. Nevertheless, students in the Faculty of Education understand foreign cultures more deeply and tend to learn English in a more enjoyable manner than those in the combined class.

Table 7: Multiple comparison tests among categories (Total)

	L 1	L 2	M1	M2	SE	F	P
C1	E	BS	4.813	4.511	.075	4.044	.000
C2	E	BS	4.564	4.594	.075	.414	<i>n.s.</i>
C3	E	BS	4.945	4.519	.075	5.724	.000
C4	E	BS	4.850	4.869	.075	.256	<i>n.s.</i>

The data were divided in terms of student English level or class, and analyzed using the two-way ANOVAs in order to identify any differences between countries in each category. As mentioned in the Research Methods, in general the classes in Liberal Arts Education were classified based upon students' TOEIC scores. The mean scores of the classes, Group 1 and Group 2, were 381 points and 489 points, respectively. Group 1 belonged to the Faculty of Education, while Group 2 was a combined class including the Faculties of Letters, Integrated Arts & Sciences, Economics and Law.

Table 7 shows that all mean scores of categories tend to be very high. As for each category, the data obtained from the Education class was analyzed using the Multiple comparison test, Bonferroni. As a result, there were significant differences between China and Hawaii regarding C1, C2, and C3 (Table 8). This implies that, compared to the teaching content, China, students understand foreign cultures of Hawaii more deeply and were much more motivated into English learning by the correspondent content. In addition, regarding the materials, Hawaii, the data results show the significant differences between Hawaii and Sri Lanka when it comes to C1 C2 and C3, suggesting that almost the same things as the above can be said between Hawaii and Sri Lanka.

The mean scores of all categories in the BS class show the higher numerical values. As for each category, the Multiple Comparison test, Bonferroni was conducted and the data was analyzed. As a result, since the numerical values of Categories in China regarding C1 through C3 were somewhat lower, there were significant differences between China and the other countries (Table 9). The data results indicate that, compared to the text content of China, students could deepen intercultural understanding of the other countries (Hawaii, Sri Lanka and Scotland) and be more attracted by the content of the more interesting stories. Also, it seems that this kind of learner awareness led to enhancement of learner motivation into further English study. Regarding C4 (Effectiveness of questions) related to text content, there was a significant difference only between China and Hawaii. As the data shown in Table 9 indicates, the mean score of C4 in China was very high and there was statistically no significant difference between China and the other two countries. This shows that students had a strong awareness of how effective the four types of questions were.

Table 8: Multiple Comparison Tests (Education class)

	L1	L 2	M1	M 2	SD	F	P
C1	Ch	Ha	4.566	5.026	.092	4.998	.000
	Ch	Sri	4.566	4.737	.092	1.856	<i>n.s.</i>

	Ch	Scot	4.566	4.921	.092	3.855	.001
	Ha	Sri	5.026	4.737	.092	3.141	.011
	Ha	Scot	5.026	4.921	.092	1.142	<i>n.s.</i>
	Sri	Scot	4.737	4.921	.092	1.999	<i>n.s.</i>
C2	Ch	Ha	4.421	4.746	.092	3.522	.003
	Ch	Sri	4.421	4.421	.092	9.646	<i>n.s.</i>
	Ch	Scot	4.421	4.667	.092	2.666	.048
	Ha	Sri	4.746	4.421	.092	3.522	.003
	Ha	Scot	4.746	4.667	.092	0.857	<i>n.s.</i>
	Sri	Scot	4.421	4.667	.092	2.666	.048
C3	Ch	Ha	4.868	5.132	.092	2.856	.027
	Ch	Sri	4.868	4.798	.092	0.762	<i>n.s.</i>
	Ch	Scot	4.868	4.983	.092	1.238	<i>n.s.</i>
	Ha	Sri	5.132	4.798	.092	3.617	.002
	Ha	Scot	5.132	4.983	.092	1.618	<i>n.s.</i>
	Sri	Scot	4.798	4.983	.092	1.999	<i>n.s.</i>
C4	Ch	Ha	4.678	4.875	.092	2.142	<i>n.s.</i>
	Ch	Sri	4.678	4.875	.092	2.142	<i>n.s.</i>
	Ch	Scot	4.678	4.974	.092	3.213	.009
	Ha	Sri	4.875	4.875	.092	5.151	<i>n.s.</i>
	Ha	Scot	4.875	4.974	.092	1.071	<i>n.s.</i>
	Sri	Scot	4.875	4.974	.092	1.071	<i>n.s.</i>

Ch: China; Ha: Hawaii; Sri: Sri Lanka; Scot: Scotland

Table 9: Multiple comparison tests (BS class)

	L1	L 2	<i>M1</i>	<i>M 2</i>	<i>SD</i>	<i>F</i>	<i>P</i>
C1	Ch	Ha	4.089	4.667	.086	6.695	.000
	Ch	Sri	4.089	4.633	.086	6.309	.000
	Ch	Scot	4.089	4.656	.086	6.566	.000
	Ha	Sri	4.667	4.633	.086	0.386	<i>n.s.</i>
	Ha	Scot	4.667	4.656	.086	0.129	<i>n.s.</i>
	Sri	Scot	4.633	4.656	.086	0.258	<i>n.s.</i>
C2	Ch	Ha	4.282	4.785	.086	5.837	.000
	Ch	Sri	4.282	4.615	.086	3.863	.001
	Ch	Scot	4.282	4.696	.086	4.807	.000
	Ha	Sri	4.785	4.615	.086	1.974	<i>n.s.</i>
	Ha	Scot	4.785	4.696	.086	1.030	<i>n.s.</i>
	Sri	Scot	4.615	4.696	.086	0.944	<i>n.s.</i>
C3	Ch	Ha	4.207	4.770	.086	6.523	.000
	Ch	Sri	4.207	4.504	.086	3.433	.004
	Ch	Scot	4.207	4.593	.086	4.463	.000
	Ha	Sri	4.770	4.504	.086	3.090	.013
	Ha	Scot	4.770	4.593	.086	2.060	<i>n.s.</i>
	Sri	Scot	4.504	4.593	.086	1.030	<i>n.s.</i>
C4	Ch	Ha	4.717	4.994	.086	3.219	.008
	Ch	Sri	4.717	4.894	.086	2.060	<i>n.s.</i>
	Ch	Scot	4.717	4.872	.086	1.803	<i>n.s.</i>
	Ha	Sri	4.994	4.894	.086	1.159	<i>n.s.</i>
	Ha	Scot	4.994	4.872	.086	1.416	<i>n.s.</i>
	Sri	Scot	4.894	4.872	.086	0.258	<i>n.s.</i>

Ch: China; Ha: Hawaii; Sri: Sri Lanka; Scot: Scotland

RESEARCH QUESTION (3): FREE DESCRIPTION

After learning each country/area, students were asked to freely describe their impressive or interesting parts etc. about the country/area. The main free comments collected after reading the story of each country were categorized and then they are shown in Table 10 & 11.

When it comes to the total average number of each category, the comment described most was ‘Understanding foreign culture’. In case of the Education class Table 10 shows that on the average 17 out of 38 students commented on it. In the BS class the average number was 17.25 out of 45 students (Table 11). It is considered that, through the units (four countries/areas) they learned, they recognize they could know different things in those nations and broaden their minds in many respects.

Table 10: Free Description (Education class)

Comments	China	Hawaii	Sri Lanka	Britain	AVG
Understanding different culture	11	22	17	18	17
Story of real experience/failure	19	4	12	3	9.5
(The content) Interesting	14	6	5	10	8.75
Want to go	0	8	2	7	4.25
Enjoy reading/studying	6	7	0	4	4.25

The second most comment in the free description was that they are impressed with the story of the writer’s actual experiences and failures. As for ‘Story of real experience/failure’, though the average numbers of the students writing the comment in Education and BS were 9.5 and 9.75, respectively. However, in case of China the total number of students was 37, overwhelmingly the large number among four countries. In short, the writer had a terrible and embarrassing experience of flooding the room with water at the hotel. While reading the passages, students might have felt as if it were their own affair and they probably thought it could happen to anybody as well. It is considered that the content of the story enthralled the students in class.

Also, regarding the third most comment, ‘the content was interesting/a lot of fun’, the total number of their comments on China was much larger (24 out of 83) than that of other nations. As mentioned above, it seems that it is related to the writer’s terrible experience and the students have been attracted by the writer’s urgent situation in the story. Interesting enough, in both Education and BS (combined faculties) classes, nobody answered that they want to go to China. As seen in the free comments, this result seems to have a strong relation with the bad image of China/Chinese people and environmental problems there.

Table 11: Free Description (BS* class)

Comments	China	Hawaii	Sri Lanka	Britain	AVG
Understanding different culture	10	17	17	25	17.25
Story of real experience/failure	18	6	13	2	9.75
(The content) Interesting	10	7	1	5	5.75
Want to go	0	13	1	12	6.5
Enjoy reading/studying	1	7	3	2	3.25

*BS: Letters, Integrated Arts & Sciences, Economics and Law

Further, seven students in both classes are impressed that a hotel staffer in China was very kind and gentle when she appropriately coped with the problem the main character brought about at the hotel. In spite of their image, in the story the staffer was kind enough to talk to the guest and deal with it quickly without any complaints. Some of the students seem to have been amazed to know the big gap between their conception about the country

and the real story they read in class. Also, in the story of Hawaii there were some students who wrote the following comments:

I felt as if I were really visiting the sightseeing spots in Hawaii because the story was full of realism.

It was easier for me to read the story because of the story was full of realism.

I felt closer to the story because it contained irony and jokes.

The content of the story in Hawaii moved students and there is possibility that it made them enjoy reading English and read English more. Regarding the story of Scotland, there were students who commented like this: *I understood the on-the-spot situation clearly and felt as if I were traveling abroad while reading it.* This comment gives the teacher more courage and motivation to teach English using this kind of content based on the true story containing actual experience. This implies how important the content is when we try to make students continue to study the target language. Furthermore, one student read the part of the story with the scenes where the professor jokes with other people and commented the following: *I want to enjoy a conversation in English and become a speaker who can say some jokes in English.*

CONCLUSION

The teaching materials, including traveling abroad and encountering various kinds of trouble, were utilized in class and the extent to which the teaching contents (the four countries/areas) favored by students and the relevancy between the teaching content and student motivation were explored. The current paper evaluates the use of travel abroad materials including whether experiences might relate to enhancing motivation.

With regard to the data, while the mean scores of categories were high for both groups, in case of the BS class, the data implies that specific areas (i.e. Hawaii, Sri Lanka, and Scotland) were preferred, in comparison to the China text; conversely, for students in the Education class there were clear differences between the teaching contents, Hawaii and China/Sri Lanka. In short, there appears to be a demonstration of preference for Hawaii to the other two countries.

The current paper was conducted with a relatively small cohort and limited number of subjects for a conclusive motivation study. Considering a greater number of factors related to learner motivation, in addition to a richer variety of different textbooks and learner backgrounds would benefit additional investigations.

REFERENCES

- Cheung, C. (2001). The use of popular culture as a stimulus to motivate secondary students' English learning in Hong Kong. *ELT Journal*, 55 (1), (pp.55-61).
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Hamada, Y. (2011). What demotivates and what prevents demotivation? *Annual Research Report on General Education, Akita University*, 13, (pp.56-67).
- Hamada, Y. (2008). Demotivators for Japanese teenagers. *Journal of PAAL*, 12 (2), (pp.1-23).
- Hayashi, H. (2009). Eigo gakushuu no tanosisa juuyousei jikkou ni tsuitemo gakushuusha kannhikaku-doukiduke no kanntenn kara [Enjoyment, importance, and execution of study activities in relation to learners' autonomy: Motivational perspectives]. *Language education & technology* (46), (pp.191-212).
- Iwanaka, T. (2011). Gakushuu iyoku no koujou ni kouken suru kyoushitsu katsudou—kouryo subeki mittsu no sinnriteki yokkyuu— [Classroom activities contributing to enhancement of learning motivation—three psychological needs to consider—]. *JACET-CSCRB, Vol.8*, (pp.1-16).
- Kato, S. (2012). Eigo gakushuu ga eigo gakushuusha no naihatsuteki doukiduke ni ataeru eikyou no kennshou [Verification of effects of learning activities on English learners' intrinsic motivation]. *Studies of Language and Culture*, (6), (pp.9-22).
- Kato, S. (2008). Eigo gakushuusha to doukizuke: naihatsuteki doukizuke to gaihatsuteki doukizuke karano kousatsu [English language learners and Motivation: Implications from intrinsic motivation and extrinsic motivation]. *Kokusai keiei-bunka kennkyuu* [International Business and Culture Research], 13(1), (pp.57-65).

- Lin, Y. G., McKeachie, W. J., & Kim, Y. C. (2003). College student intrinsic and/or extrinsic motivation and learning. *Learning and Individual Differences, 13*, (pp.251-258).
- Miura, T. (2010). A retrospective survey of L2 learning motivational changes. *JALT Journal*, (pp.29-54).
- Ryan, R. M. & Deci, E. L. (2002). Overview of Self-determination theory: An organismic dialectical perspective. In E. L. Deci and R. M. Ryan (Eds.), *Handbook of Self-determination Research* (pp.3-33). New York: University of Tochester Press.
- Sakai, H. & Kikuchi, K. (2009). An analysis of demotivators in the EFL classroom. *System, 37*, (pp.57-69).
- Tanaka, H. (2009). Doukizuke ga hikui gakushuusha no doukizuke wo takameru jissennteki kenkyuu [Practical research to enhance low -motivated student motivation]. *JACET Chugoku-Shikoku Chapter Research Bulletin, 6*, (pp.69-82).
- Tanaka, H., & Hiromori, Y. (2007). Eigo gakushuusha no naihatsuteki doukizuke wo takameru kyouiku kainyuu to sono kouka no kennshou [Educational practical intervention to enhance English learners' intrinsic motivation and verification of the effects]. *JALT Journal, 29*, (pp.59-80).
- Uenishi, K. (2016). Original teaching content and student motivation in the EFL Classroom. *Hiroshima Studies in Language and Language Education, No.19*, (pp.65-81).

Fear of Missing Out at Adolescents and Academic Burn Out and School Drop Outs in Turkey

Ezgi AGCIHAN

*Institution of Social Studies,
Education Management Department,
Kocaeli University, Kocaeli, Turkey
ezgi@agcihan.com
ezgi.agcihan@kocaeli.edu.tr*

ABSTRACT

FOMO (fear of missing out) is defined the rewarding experiences that others might have when you are absent which you wish to have (Oxford Dictionary,2017). It can be characterized a desire to stay continuously connected to what others are doing. It can also be described as a fear of regret which may lead up to an excessive concern that one can miss an opportunity for social interaction, a novel experience, a profitable investment, or any other satisfying event. Social Media Web Pages and networks is one of the most common activity between adolescents and children. When social media provides various forms of information such as activities, events, and conversations happening diverse social network. It is also a way of keeping tracks of others that might also drive adolescents to uneasy feelings of missing out and also be a reason for the early school leaving. In this research we sought to find out what are the specialities of adolescents who are under the risk of FOMO and having school burn out and academic failure. For this reason we conducted a qualitative research and interviewed 20 adolescents between the ages of 14-19 that tend to leave school or experiencing academic failures and burn out and declaring that they have excessive internet usage habit. The research indicated that the adolescents that with compulsive social media use and FOMO experienced loneliness, alienation and isolation. They also stated that they they got poor academic grades, burn outs and had intention of dropping out school.

This study provides information for parents, educators, academicians interested in harnessing social media and adding value to the current research on FOMO and its implication on early school leaving for adolescents.

INTRODUCTION

Information and communication technologies (ICT) have become an important part of our daily life. The increase in new technologies and virtual communication involving personal computers, tablets, and mobile phones is causing changes in peoples' daily habits and well being (Valkenburg, &Schouten, 2006; Kim, LaRose, Peng, 2009; King et al.'s 2013;). With the rise of ICT, parents and teachers are more worried about the potential negative results of children's and adolescents' excessive use of these technologies and their applications on social media such as twitter, facebook, instagram. The researches on social media displays two different view. One shows us that social media as a noteworthy resource of positive effects on well being (e.g., boosting self-worth, selfintegrity, & self-esteem ; Gentile, 2012; Toma & Hancock, 2013,Hetz, Dawson&Cullen, 2015) the other one suggests a darker, more negative view (e.g., social media negatively affecting emotional mood; (Greitemeyer, 2014; Eldelekoglu&Batik,2013; Erdem et al's,2016). These concerns related to results of excessive social media useage has driven interest in an international phenomem " FOMO" (Przybylski et al.'s, 2013) defined as pervasive apprehension that others might be having rewarding experiences which one is absent, FOMO is described by the desire to stay continually connected with what others doing (Oxford Dictionary, 2017) .This research deals with the definition of FOMO and Excessive socia media use and also with a qualitvie point of view examines the properties of the students with FOMO who have under the risk of academic burn out and failure.

LITERATURE REVIEW

1.1 Social Media Use

SNS are defined as web-based virtual networks allowing the construction of an individual and partially public profile (Oberst et, al's , 2016). These virtual platforms for communication are rapidly present in individulas' daily routines, and although their use is increasing throughout the entire population, they are generally preferred

by adolescences and young adults. Facebook, at 1.65 billion users worldwide (Statista, 2016), is the most frequently used platform, followed by Twitter and Instagram. The age of initial Facebook use is falling down (now 12- 13 years old). Research has shown that these social media services are especially attractive for adolescents because they serve as tools to boost their social identities (Oberst et al's ,2106; Renau et,al's, 2016) by letting them to manage their profiles in order to express their desired self-image. By using those "virtual identities" they can interact with friends and other adolescences in a platform that is often filtered from motitoring adults (Carbonell & Panova, 2016). Positive effects of social media networks are the management and enhancement of human capital (Ellison, Steinfield, & Lampe, 2007), concretion with others (Spies Shapiro & Margolin, 2014),boosted self-image (Gonzales & Hancock, 2010), and the fullfilment of their need to fit (Nadkarni & Hofmann, 2012) in a technologically dominated society.

Negative Results of Excessive Social Media Use

Besides the positive aspects of online social network web sites, the fulfilling nature of this social monitoring may be leading to the come out of uncontrollable checking behaviors and excessive engagement in social media, and consequently, to negative psychological effects. Research has provided clear evidence that overuse or excessive use of ICT might have negative effects on the well-being and psychological mood of children, adolescents, and young adults (Brooks, 2015; Fox & Moreland, 2015; Kross, 2013; Rosen, et, al's, 2013; Sampasa-Kanyinga & Lewis, 2015, Oberts, et,al's 2016). With respect to SNS, excessive use has been noted as a potential mental health problem (Kraut, Patterson & Lundmark, 1998; Young & Rogers,1998; Morahan, 2005; Kuss & Griffiths, 2011). Parents usually worry about their adolescents and children being "hooked on Facebook" and spending too much time on social networks and with their smartphones, or tablets thus having less involvement with their real-life environment and with school issues. There are considerable studies showing the relationship between the time spent on SNS and lower grades (Kirschner & Karpinski, 2010; Chou& Edge, 2012), less communication with family and friends (Barker, 2009; Kim, LaRose &Peng, 2009), lower self-esteem (Mc Kenna & Bargh,2000; Kalpidou, Costin, & Morris, 2011.), and higher depression (Lin, 2016; Pantic et al's ,2012; Blease, 2015). However, the overall time spent on SNS does not seem to be the only factor in compulsive SNS use (Muench, et al.'s 2013). Similarly, excessive social media engagement itself is not considered to be problem (Turel & Serenko, 2012). Rather, specific individual exposure factors determine the possible negative psychological effects of SNS engagement, such as younger age (Blachnio et al's , 2015), deformity of the online profile (Oberst, 2016), and existing mental health problems, mainly depression (Gamez-Guadix et al's, 2013). Bhagat (2015) emphasizes that the use of SNS is associate with individuals who are experiencing psychosocial struggles, such as low self-esteem, but also with mental health problems such as anxiety, depression, and loneliness. Wortham(2011) suggest that Facebook seems to be very attractive for lonely individuals and especially those with psychopathological symptoms. Moreno (2011) show that college students with depressive symptoms are more active on Facebook and are more willing to discuss their problems publicly. The findings suggest that individuals get positive feedback online and receive support from their friends online, which could result in a more public self-presentation. The use of SNS also seems to be related to poor social adaptation, such as social anxiety (Ryan & Xenos, 2011). Davis (2012) claims that Social Media Networks can be "the Prozac of Social Communicaiton" for the ones suffering from socialfobia or alieniation as it's less risky and easier than face to face communication. The results emphasize the relationship between SNS for individuals who try to cope with real life social problems and to gratify social needs online. People with anxiety and depression might use more SNS, or it may also be that those who use social media intensively develop increased depression (Lin, 2016).

The Fear of Missing out Concept

Fear of missing out (FOMO) is defined as “ having a pervading apprehending attitude that others might be having rewarding experiences from which one is absent ” and “ a desire to stay continually connected with what others are doing” (Przybylski et al.’s 2013; Alt, 2015; Baker, Kreiger & Leroy, 2016; Elhai et al.’s, 2017). Although FOMO is not necessarily a phenomenon special to social media users, individuals with high FOMO might feel urged to check their social media more often in order to keep up to date on their friends' plans and events.

Up to now, FOMO has attracted more interest in the media than in scientific publications. Although there are still very few researches available on this relatively new construct and its theoretical background, some academic publications have showed FOMO to be a mediator variable between personal characteristics and social media engagement. It has been suggested that FOMO could be as a mediator linking deficits in psychological needs to social media engagement, and FOMO also turned out to be a mediator between different indicators of well-being (need satisfaction, general mood and life satisfaction) and social media engagement (Przybylski et al.’s,2013). FOMO also mediated the direct relationship between motivational factors and social media engagement in the classroom (Alt, 2015). In a recent study, FOMO as been shown to be a predictor of smartphone addiction (Chotpitayasunondh & Douglas, 2016). We can conclude that individuals with a low degree of basic need satisfaction (for instance, of connectedness with others) could be more tempted to engage with social media, because SNS, especially when accessed via mobile devices, serve as an easy means of staying in touch with others and participating in their lives (Casale, Tella & Fioravanti, 2015). FOMO might explain the addiction for people with chronic deficits in psychological need satisfaction to constantly search for updates and opportunities to engage with social media, even when this takes place in potentially inappropriate or dangerous situations, e.g. while driving (Przybylski et al.’s, 2013), attending a class (Alt, 2015; Turkle, 2011), or being in a face-to-face interaction (Chotpitayasunondh & Douglas, 2016). Adolescents with psychopathological problems (especially anxiety and depression) could also develop higher FOMO because of their perceived social deficits. Being connected with and being accepted by one's peers is of utmost importance in adolescence (Desjarlais & Willoughby, 2010; Eldelekoglu&Batik, 2013; Hertz, Dawson & Cullen, 2015), so SNS are especially attractive for these younger individuals, in order to provide them greater levels of social involvement. By using SNS, these adolescents may be able to satisfy their need to belong, but they also have a higher risk of suffering from anxiety when they have the feeling that they do not belong and that they are missing out on important shared experiences.

According to the 2015 reports of “We are social” In Turkey, there were 37. 7 million active internet users and over 40 million social media accounts. Beside this, Individuals spent 4. 5 hours in front of computers and about 3 hours of it was surfing on social media. When considering the social media and internet use booming in Turkey FOMO is becoming a preferred content for scholars. Even it is a recent topic, there have been also several researches in Turkey related to FOMO. The FOMO scale has been adapted to Turkish and applied to 200 university students in Eskisehir and have been found out that the data collected by university students supports the hypothesis that there is a relationship between excessive social media checking behaviour and FOMO(Gokler et al.’s,2016).In another research applied to high school students conducted by Kuleli(2017) indicated that no significant correlation found out between FOMO and Social Desirability Bias. This phenomenon and related concerns led us to question what are the properties of the adolescences who were under the risk of school drop out because of excessive social media use. Also did these adolescences experience Fear of Missing Out?

METHODS

Research Model

This study aims to explicate perceptions of the adolescences about FOMO concepts deeply. Therefore, the phenomenology approach of qualitative descriptive models were taken up as a research model. Yildirim and Simsek(2008) claim that the phenomenology approach aims to define experiences, perceptions, the meanings and the attributions towards these concepts. Thus we can discover the experiences and the meaning of data analysis.

Research Group

The purposive sampling method was used in this research. According to Yildirim and Simsek (2008) purposive sampling allows situations which are thought to have affluent information to be explored deeply. In this context, the purposive sampling method is very useful in exploring and explaining the events and phenomena in most of the situations. The convenience sample consisted of 20 students at different grades experiencing excessive social media use and academic failures in Turkey. Of 13 students were female and 7 of 20. The average age of participants was 16.5, with a range of 14 -18. 17 of the students reported that they were attending private or public high school in Istanbul Province, Turkey and 3 of them reported that they had intention of dropping out schooling and they rejected going on the classes anymore.

Data Collection and Tools

In order to find out the views of the adolescences, a semi structured interview forms developed by the researcher. The interview forms were prepared with the suggestions of specialists after a literature review related to the FOMO and Social Media Use. The interviews were made with face to face at counseling service rooms of the schools in Istanbul, Turkey and each interview took approximately 30 or 40 minutes. The data collection process ended up in a month. The students were encouraged to answer questions and provide as much as detail and insight as possible.

2.4 Data Analysis

After transcription, the researcher read and coded the answers of the open ended questions which were answered by the participants. After that, Categories were created by comparing similarities and differences through participants' expressions. Descriptive Analysis Technique was used to encode the data which were obtained by the participants. For Each question the similarities and differences were determined and the codes were formed. By the way, these datas were tabled. Because of ethical concerns, the researcher didn't use the participants real names and all of them were named with a coding letter and number i.e,

“G8”

FINDINGS

During the interviews, students openly shared their opinions, and thoughts. After transcription and coding, many commonalities were found and themes emerged. After our initial coding, we were able to consider their their responses into larger themes; excessive social media use, the fear of missing out.

Table 1. Excessive Social Media Use

Theme	Codes	Participants	f
Excessive Social Media Use	use of social media as soon as waking up.	G1,G4,G6,G7,G8 G9,G10,G11,G12, G14,G16,G19,G20	13
	use social media when having breakfast	G1,G2,G3,G5,G7,G8, G10,G13,G16, G18,G19	11
	Use of social media while having lunch.	G2,G4,G5,G6,G8,G10, G12,G13,G14, G16, G18, G19,G20	12
	Use social media while having dinner	G1,G3,G5,G7,G10, G16,G17,G18,G19	10
	Use social media just before going to bed	G1,G2,G4,G5,G7,G9 G11,G13,G14,G16, G17,G19	12

The vast majority of students stated that they used mobile phones frequently (5.6 hours in a day) and checked out their social media accounts several times in a day. It may seem that the participants use social media to waste time and alleviate boredom. The results also indicate that using social media may be an important part of the majority of participants' every day routine.

.....In the morning , The first thing I do is generally checking my face book if there is something new.(G2)

.....When we have dinner I like hanging on facebook and checking whats going on.(G14)

.....Even It's late at night I never go to bed without messaging my friends on messenger. (G16)

Table 2 The Reasons of Excessive Social Media Use

Theme	Codes	Participants	f
Reasons for Excessive Media Use	To build a new social identity	G2,G5,G6,G7,G9 ,G10,G11,G12, G13,G16,G18,G19	12
	To boost self esteem and well being	G1,G3,G4,G5,G7,G8, G11,G13,G16, G19,G20	10
	The Purpose of Communication	G1,G3,G4,G6,G8,G10, G11,G13,G14, G15, G17, G19,G20	13

The research indicates that most of the adolescences prefer to use social media to develop a new identity to attract others and being a favourable person. By engaging the social media they get in touch with others and see it as a tool to develop social competence and an opportunity to deepen their relationships. The adolescences admitted that they use social media to promote themselves and a kind of self promotion and presentation.(12/20)

..... I use instigram to tell people... look I have been to this beautiful place.(G4)

....Having likes on facebook or instigram is important for me as I see it as a kinf of competition. (G19)

....I sometimes think about what is the best picture of mine before posting as my friends see and comment on it.(G3)

Peer acceptance and interpersonal feedback is a really important issue for adolescences. According to this research especially half of the adolescences who had the problem of low self esteem and depression suffered most from the negative side effect of excessive social media use. They saw social media a way of boosting self esteem and well being as communication by using social media requires less face to face communication (10/20).

....I use twitter as I find it really cool and have much more friends online than real life even I don't know most of them (G5).

.....I'm not a kind of person that who can socialize easily but on instigram I have many followers that like my pictures (G20).

Most of the adolescences also perefered to use social media as a communication tool. They stated that they used texting on facebook or instigram instead of phoning or face to face interaction.(13/20)

...My mother sometimes get angry when I text her on facebook to ask something (G7).

....I don't like talking on the phone, texting is easier for me (G10).

....If I have good time it's important for me to post on instigram or facebook(G11)

....I find it difficult to answer on phone ,texting is easier and funnier for me.(G12)

Table 3. FOMO and Academic Failure, and Burn out and Drop out

Theme	Codes	Participants	f
FOMO and Academic Failure and Burn Out	Feeling isolated or alienation and Experiencing FOMO	G2,G5,G6,G7,G9, G10,G11,G12, G13,G16,G18,G19	12
	Feeling Anxiety and depression because of missing a life event when school time, or studying for a subject	G2,G3,G4,G6,G8,G10, G11,G13,G16, G20	10
	Keeping Track of other peers on Social Media during school time	G1,G4,G5,G7,G9, G11,G17	7
	Feeling Burn out or poor grades and drop outs because of experiencing FOMO	G3,G4,G8	3

Majority of the students reported that they could be isolated or alienation if they didn't have social media account and they would feel unhappy or dissapointed if they didn't understand what was going on social media (12/20)

...I feel isolated or alienated if I don't log in my facebook account.(G11)

....I get anxious if my friends are making fun of me when I don't understand a joke related to social media (G13).

Half of the students mentioned that while they were taking their courses or studying for an exam, they they felt depressed or anxious when they thought the possibility of their friends could do something enjoyable (e.i playing a playstation game or going out). So they reported that they somtimes had difficulties at concentrating when studying for a subject or having an exam. They also stated that they could be worried if their friends had fun without them.(10/20).

....I sometimes feel why I'm not able to post on instigram like my friends and studying this dull courses (G10).

....I can't concentrate my studies as instead of going out , as I get jeleous when I see my friends posting on on Facebook when they are playing bowling or going to a concert (G17).

.... I don't want to go on my studies as I feel I 'm missing out my best days studying here (G12).

Some students indicated that even they were on a vacation they felt in need of keep tabs on what their friends were doing. And they mentioned that they would feel worried if they missed a planned events with their friends (7/20).

...I can't think of my self spending a day without messaging my friends on facebook.(G7)

...Even I 'm on a holiday I feel the need of checking my friends' status on facebook.(G9)

....I check my social media accounts as I feel worried if I miss out an important event or invitation.(G11)

Some of the students declared that they were wondering that if they were spending too much time on social media to keep up with what was going on. This point o view shows that they were actually experiencing. Also they admitted that spending on so much time on social media and experiencing FOMO could be a reason of getting poor grades at school and they added that being hooked on social media could be a reason for burn outs.(7/20)

.....When I saw my friends sharing their successes I feel stucked an felt that I'm incapable of doing something good.(G3)

..... I don't want to g oto school anymore as I feel stucked between my homeworks and having pleasurable time like my friends do.(G8)

DISCUSSION

The aim of the present study was to determine the properties of the adolescences experiencing academic failures and FOMO and negative consequences of excessive use social networking sites (SNS). The study provided evidence that the students that experienced FOMO had also academic failures, burn outs and intention to drop out schooling. Specifically, the findings of this study indicates that adolescences with a great deal of FOMO tend to have compulsive social media check outs in their daily routine, as they have poor social skills they see social media as a tool of building a new identity and boost of self esteem and the main purpose of communication. The findings were also related to the reasons of schooling drop outs and academic failures of the students experiencing FOMO. According to the findings, the adolescences experiencing FOMO tend to feel isolated and alienated more and they feel anxiety or depression because of missing out a fulfilling event while they are studying for something or attending to the classes because of that feeling they tend to have poorer school grades, academic burn out or schooling drop outs.

When the literature examined, the findings that the properties of adolescences experiencing FOMO and academic failure and burn outs supports the previous researches. Past Researches, to our knowledge, has not presented a qualitative point of view related to FOMO and academic failure, drop outs and burn outs (Przybylski et al.'s 2013; Alt, 2015; Lai, et al.'s, 2016; ; Gokler et al.'s, 2016; Baker, Kreiger & Leroy, 2016; Elhai et al.'s, 2017; Kuleli, 2017). The properties of adolescences experiencing FOMO and and academic failures and burn outs can be explained by the suggestion that modern technologies have changed several facts of the human experience and that digital communication mediums can impair self-reflection and degrade well-being (Turkle, 2011) and learning skills.

Finally, related to these changes in technology and these research findings, parents, academic counselors and educational practitioners working with adolescences experiencing academic or interpersonal problems should recognize the impact social media use and FOMO have on those problems and incorporate discussions of social media and FOMO into one-on-one conversations.

CONCLUSION

This study adds to a small but growing literature on the fear of missing out (e.g., Alt, 2015; Chaudhry, 2015; Filippou et al., 2014). It demonstrates the association between time spent on social media and FoMO and academic failure and burn outs and drop outs at young generation. Additionally, it establishes the properties of young age groups who use social media sites at higher rates. These findings provide foundational work to understand these relationships from which future research on social media use can build. It 's suggested to the reseachers who want to study FOMO to find out the relationship between FOMO and scool burn outs or school drop outs or desing a quantitative research applied to a larger group of people to find out the effect of FOMO or a research to be applied to other age groups.

REFERENCES

- Alt, D. (2015). College students' academic motivation, media engagement and fear of missing out. *Computers in Human Behavior*, 49, 111–119. <http://dx.doi.org/10.1016/j.chb.2015.02.057>
- Barker, V. (2009). Older adolescents' motivations for social network site use: The influence of gender, group identity, and collective self-esteem. *Cyberpsychology& Behavior*, 12(2), 209-213. <http://dx.doi.org/10.1089/cpb.2008.0228>.
- Baker, Z. G., Krieger, H., & LeRoy, A. S. (2016). Fear of missing out: Relationships with depression, mindfulness, and physical symptoms. *Translational Issues in Psychological Science*, 2(3), 275-282. <http://dx.doi.org/10.1037/tps0000075>
- Bhagat, S. (2015). Is Facebook a planet of lonely individuals? A review of literature. *The International Journal of Indian Psychology*, 3(1), 5-9.
- Blease, C., R. (2015). Too Many Friends, Too Few 'Likes' Evolutionary Psychology and Facebook Depression. *Review of General Psychology*, 1, 1-13
- Błachnio, A., Przepiorka, A., & Pantic, I. (2015). Internet use, Facebook intrusion, and depression: Results of a cross-sectional study. *European Psychiatry*, 30(6), 681-684. <http://dx.doi.org/10.1016/j.eurpsy.2015.04.002>.

- Brooks, S. (2015). Does personal social media usage affect efficiency and well-being? *Computers in Human Behavior*, 46,26-37. <http://dx.doi.org/10.1016/j.chb.2014.12.053>.
- Casale, S., Lecchi, S.&Fioravanni, G.(2015). The association between psychological well-being and problematic use of Internet communicative services among young people.*The Journal of Psychology*.149,5,480-497
- Carbonell, X., & Panova, T. (2016). A critical consideration of social networking sites' addiction potential. *Addiction Research & Theory*, 6359 (July), 1-13. <http://dx.doi.org/10.1080/16066359.2016.1197915>.
- Chotpitayasunondh, V. & Douglas, K.(2016). How “phubbing” becomes the norm: The antecedents and consequences of snubbing via smartphone. *Computers in Human Behaviour* 10, 9-18
- Davis RA. (2001) A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior*,17,187–195
- Dejarlais, M. & Willoughby, T. (2010). A longitudinal study of the relation between adolescent boys and girls' computer use with friends and friendship quality: Support for the social compensation or the rich-get-richer hypothesis?. *Journal of Computers in Human Behavior* 26,5,896-905
- Eldeleklioglu, J.& Batik, M. (2013). Predicative Effects of Academic Achievement, Internet Use Duration, Lonelines and Shyness on Internet Addiction.Mediated Communication, 12, 1143-1168. <http://dx.doi.org/10.1111/j.1083-6101.2007.00367.x>.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook “friends”: Social capital and college students' use of online social network sites. *Journal of Computer- Mediated Communication*.11(2),30-38
- Erdem, H. , Kalkin, G.,Turen, U. & Deniz, M.(2016). The Effects of No Mobile Phone Phobia (NOMOFOBI) On Academic Performance Among Undergraduate Students. Suleyman Demirel University The Journal of Faculty of Economics and Administrative Sciences. 21,(3),923-936
- Elhai, J., Dvorak, R, Levine, J. & Hall, B. (2017). Problematic Smartphone Use:A Conceptual Overviev and Systematic Review of Relations with Anxiety and Depression Psychopathology. *Journal of Affective Disorders*. 2, 251-259
- Fox, J., & Moreland, J. J. (2015). The dark side of social networking sites: An exploration of the relational and psychological stressors associated with Facebook use and affordances. *Computers in Human Behavior*, 45,168-176. <http://dx.doi.org/10.1016/j.chb.2014.11.083>.
- Gentile, D.(2012). Reassessing Media Violence Effects Using a Risk and Resilience Approach to Understanding Aggression. *Psychology of Popular Media Culture*,12, 2160-4134
- Gokler, M., Aydin, R., Unal, E. & Metintaş, T.(2016).Journal of Anatolia Psychology Association.17,53-39
- Greitemeyer, T.(2014). Video games do affect social outcomes: a meta-analytic review of the effects of violent and prosocial video game play. *Personlity, Social Psychology Bulletin*.5, 578-589
- Gonzales, A. L., & Hancock, J. T. (2010). Mirror, mirror on my Facebook wall: Effects of exposure to Facebook on self-esteem. *Cyberpsychology, Behavior, and Social Networking*, 14(12) 79-83. <http://dx.doi.org/10.1089/cyber.2009.0411>.
- Hertz, P. R, Dawson, C. L, & Cullen, T. (2015). Social Media Use and the Fear of Missing out (FoMO) While Studying Abroad. *Journal of Research on Technology in Education*, 47(4),259-272
- Kalpidou, M., Costin, D., & Morris, J. (2011). The relationship between Facebook and the well-being of undergraduate college students. *Cyberpsychology, Behavior, and Social Networking*, 14(4), 183- 189. <http://dx.doi.org/10.1089/cyber.2010.0061>.
- Hetz, Patricia R.& Dawson, Christi L& Cullen, Theresa A.(2015). Social Media Use and the Fear of Missing out (FoMO) While Studying Abroad. *Journal of Research on Technology in Education*, 47, 259-272
- Kim, J., LaRose R., Peng W.(2009). Loneliness as the cause and the effect of problematic Internet use: the relationship between Internet use and psychological well-being. *Cyberpsychol Behaiourv.*, 4, 451-455. [hptt://doi:10.1089/cpb.2008.0327](http://doi:10.1089/cpb.2008.0327).
- King, A. L. S., Valença, A. M., Silva, A. C. O., Baczynski, T., Carvalho, M. R., & Nardi, A. E. (2013). Nomophobia: Dependency on virtual environments or social phobia? *Computers in Human Behavior*, 29(1),140-144. <http://dx.doi.org/10.1016/j.chb.2012.07.025>.
- Kirschner, P. A., & Karpinski, A. C. (2010). Facebook and academic performance. *Computers in Human Behavior*, 26,(6), 1237-1245. <http://dx.doi.org/10.1016/j.chb.2010.03.024>.
- Kraut R., Patterson M, Lundmark V, Kiesler S, Mukopadhyay T, Scherlis W.(1998). Internet paradox. A social technology that reduces social involvement and psychological well-being?.*The American Psychologist*. 53 (9),1017-31

- Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N.,...Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *Plos One*, 8(8),-69841. <http://dx.doi.org/10.1371/journal.pone.0069841>.
- Kuleli, S.(2017). Investigating the relationship between FoMO and social desirability response bias among high school students. *Inonu University International Computer Instructional Technologies Symposium*
- Lin, L. Y., Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B.,...Primack, B. A. (2016). Association between social media use and depression among U.S. young adults. *Depression and Anxiety*, 33(4), 323-331. <http://dx.doi.org/10.1002/da.22466>
- McKenna, Y. & Bargh, J. (2000) The Internet and Social Life.*Annual Reviews of Psychology*.55,579-590
- Muench, F., Hayes, M. Shao, S. (2015). *Journal of Behavioral Addiction*,4 (3), 163-169
- Moreno, M. A., Jelenchick, L. A., Egan, K. G., Cox, E., Young, H., Gannon, K. E., et al. (2011). Feeling bad on facebook: Depression disclosures by college students on a social networking site. *Depression and Anxiety*, 28(6),447-455. <http://dx.doi.org/10.1002/da.20805>.
- Nadkarni, A., & Hofmann, S. G. (2012). Why do people use facebook? *Personality and Individual Differences*, 52(3), 243-249. <http://dx.doi.org/10.1016/j.paid.2011.11.007>
- Oberst, U., Renau, V., Chamorro, A., & Carbonell, X. (2016). Gender stereotypes in Facebook profiles: Are women more female online? *Computers in Human Behavior*, 60, 559-564. <http://dx.doi.org/10.1016/j.chb.2016.02.085>.
- Oxford University Dictionary.(2017).*The Definition of Fomo*. <https://en.oxforddictionaries.com/definition/fomo>
- Pantic, I., Damjanovic, A., Todorovic, J., Topalovic, D., Bojovic-Jovic, D., Ristic, S., et al. (2012). Association between online social networking and depression in high school students: Behavioral physiology viewpoint. *Psychiatra Danubina*, 24(1), 90-93.
- Przybylski, A., K., Murayama, K., Dehaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, 29, 1841-1848.
- Renau, V., Gil, F., Oberst, U., & Carbonell, X. (2015). *Internet and mobile phone addiction*. In Z. Yan (Ed.), *Encyclopedia of mobile phone behavior*,807-817). Hershey, PA: IGI Global.
- Rosen, L. D., Whaling, K., Rab, S., Carrier, L. M., & Cheever, N. (2013). Is Facebook creating “iDisorders”? The link between clinical symptoms of psychiatric disorders and technology use, attitudes and anxiety. *Computers in Human Behavior*, 29,(3), 1243-1254. <http://dx.doi.org/10.1016/j.chb.2012.11.012>.
- Ryan, T., & Xenos, S. (2011). Who uses Facebook? An investigation into the relationship between the Big Five, shyness, narcissism, loneliness, and Facebookusage. *Computers in Human Behavior*, 27(5),1658-1664. <http://dx.doi.org/10.1016/j.chb.2011.02.004>.
- Sampasa-Kanyinga, H., & Lewis, R. F. (2015). Frequent use of social networking sites is associated with poor psychological functioning among children and adolescents. *Cyberpsychology, Behavior, and Social Networking*, 18(7),380-385. <http://dx.doi.org/10.1089/cyber.2015.0055>.
- Statista. (2016). *The statistics portal*. www.statista.com.
- Toma, L. & Hancock, T.(2013). Self-Affirmation Underlies Facebook Use. *Personality and Social Psychology Bulletin*,39,321-331
- Turel, O., & Serenko, A. (2012). The benefits and dangers of enjoyment with social networking websites. *European Journal of Information Systems*, 21(5), 512-528. <http://dx.doi.org/10.1057/ejis.2012.1>.
- Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. New York: Basic Books
- Valkenburg P., M. & Schouten A. P.(2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *Cyberpsychol Behaviour* 5, 84-90
- Wortham, J.(2011).Feel Like a Wallflower? Maybe It's Your Facebook Wall. *The New York Times*
- Yildirim, A., & Simsek, H. (2008). *Sosyal bilimlerde nitel arastirma yontemleri*. Ankara: Seckin Yayinlari.
- Young, K. & Rodgers, R. (1998). The Relationship Between Depression and Internet Addiction. *Cyber Psychology&Behaviour* 1(1), 25-28

Five Stages for Design and Establishing an Effective MOOC SYSTEM

Amer Saleem ELAMEER

Informatics Institute for Postgraduate Studies (IIPS)

Iraqi Commission for Computers and Informatics (ICCI)

amerelameer@yahoo.com

Ghassan H. MAJEED

University of Baghdad

Ministry of higher education and scientific research

General Director of the Research and Development Directorate

ghmajeed@gmail.com

Raghad Basem MAHMOOD

Informatics Institute for Postgraduate Studies (IIPS)

Iraqi Commission for Computers and Informatics (ICCI)

raghad93rrr93@gmail.com

ABSTRACT

The chances a full education in Iraq different from one to another despite their desire because there are no suitable circumstances for each learner. To educate by the traditional methods in this recent time considered as the main obstacle that impeded any learner to develop himself and gain all the possible knowledge. In the twenty-one century, we all need to have the opportunity to continue our learning because the lifelong learning becomes the most fundamental concept in our life, so the need of developing a new method for electronic learning in order to achieve our purpose for everyone despite the time and place, that the same time make the process of learning more interesting, enjoyable and effective in a less effort.

Hence, this research aims to design and implement MOOC system to develop the method of learning followed in Iraqi higher education.

INTRODUCTION

The Internet and the World Wide Web have made important changes to all parts of our lives extending from a worldwide economy, individual, commerce, news, and learning. In addition to, The Internet has made online learning conceivable, and numerous researchers and teachers are concerned about online learning to enrich and improve student learning results (Billington & Fronmueller, 2013). Along these lines, MOOCs have attracted a huge number of individuals from everywhere throughout the world (Gaebel, 2014). A MOOCs (Massive open online courses) is an electronic class aimed at a widely global participation and open access via the Web network. MOOCs have to bring the educational opportunities of elite organizations to a wider audience, and for addressing the matter of increasing costs of advanced education (Reich, 2015). An MOOC open new entry depends on using free courses, one that offers prominent collaborative and conversational chances for students to collect and discuss the course material. Depending on the massive open online courses (MOOC) could significantly changing the way of teaching and learning. These online courses have the adaptability to make a connection between people through sharing online videos and homework, letting participants study at their own pace (Koutropoulos & Hogue, 2012). This means that MOOCs have the potential to build a way for life-long education processes in the future. In this paper, we will present a method for design and implementation MOOC system in Iraq in order to enhance and enrich the higher education.

MOOC E-LEARNING FRAMEWORK

The orbital e-education framework was used as the e-learning frame work because it was tested widely in Iraqi learning environments and a lot of e-learning applications in Iraq used it, and it is the only framework that covers the education sustainability and development which is very important in our MOOC designs.(Elameer,2011).

METHODOLOGY

The research methodology that follows in this paper which entirely uses the ADDIE framework.

ADDIE model is one of the most common models used in the website design field that is a guide to producing an effective design. The ADDIE model has been divided into five stages: Analysis, Design, Development, Implementation, and Evaluation(Danks, 2011). Each step in the model has an outcome that feeds into the next step in the sequence.

This process will help to ensure the covering all aspects of a successful platform and make the platform as effective as possible. The ADDIE model also can help to save money and time otherwise spent on solving sudden problems (see figure (1)).

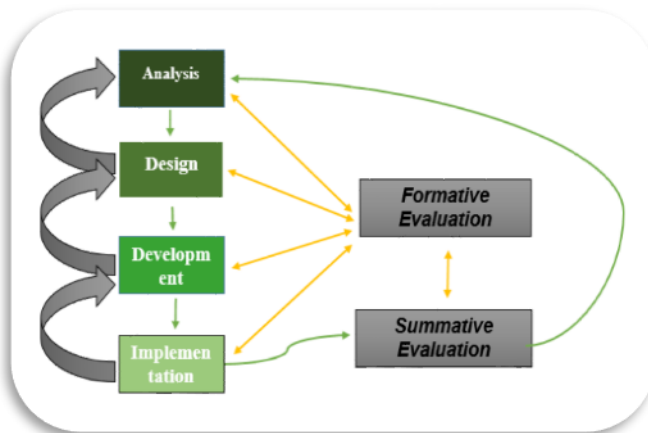


Figure (1): The five phases of ADDIE model.

Analysis Phase

The analysis phase is the foundation for all other phases. So that when doing this phase before creating the plan, developing, or even implementing, a huge amount effort and time will be saved. During this phase, the problem is identified and the data requires to the design should be collected. The analysis also considers the description of constraints, the learning environment, and the timeline for the project. The outputs of this phase usually include the research goals (aimed at identifying the end desired result), and a list of tasks to be instructed. These outputs will be the inputs for the Design stage.

This phase is the essential part of the present work, where the success of this phase leads to project success.

During this stage, the main problem of the project has been identified which is the adoption of old methods used in education that still follow in Iraq. So in this stage to gather information about the problem, several method are use:

- Interviews with students at different stages to find out their requirements and needs that help them in learning, as well as asking them some questions about what will be preferred available in the proposal MOOC system.
- Gathering some information from teachers to find out what are the best means to help them to facilitate the process of teaching, communicating information to students in the simplest and easiest ways.
- Comparison between the most famous MOOCs platforms to choosing the best, newest and the most appropriate methods used in teaching in order to apply it in the proposal system.

Design phase

The design phase is the next step in ADDIE model. It is a regular process of specifying learning objectives, the look, and feel, graphic design, user interface, and content is determined here. The method in this phase should be systematic with a rational, orderly the process of identification, improvement, and assessment of planned strategies which target the achievement of the project's goals. It should follow a very specific set of guidelines, and each part of the plan must be executed with the care to detail. Being a stickler for the details is crucial to the achievement of the design stage.

In this phase of the project, the information that gathered in the previous phase (analysis phase) are used to start drawing illustration planned to how MOOC system screen look.

First, drawing a wireframe that is considered an extremely important stage of the designing process. A wireframe is a basic interface guide that proposes the structure of an interface and the links between its pages (Robbins, 2012).

Second, sketching a site map to clearly understanding of what layout needs when designing sections beyond the homepage and clarify the content that needs to be on site as well as help to eliminate unnecessary pages.

Courses structure design

The main part of the proposal MOOC system is the courses that are designed to achieve the main goal of the project.

A course is the entire program of studies required to complete study of a specific subject. The course is always led by one or more instructors (teachers or professors). In this area, describes how the whole course is structured and in what arrangement the learning steps follow. Moreover, in order to make students is freely to select their particular electives from among a wide range of courses, the courses in the MOOC system are divided into eight competencies to include all sections and not concerned with the specific study.

The eight competencies of the courses are (see figure (2)) Computers, Medicine, Science, Geometric, Administrative, Humanist, Agricultural, and eventually the others.

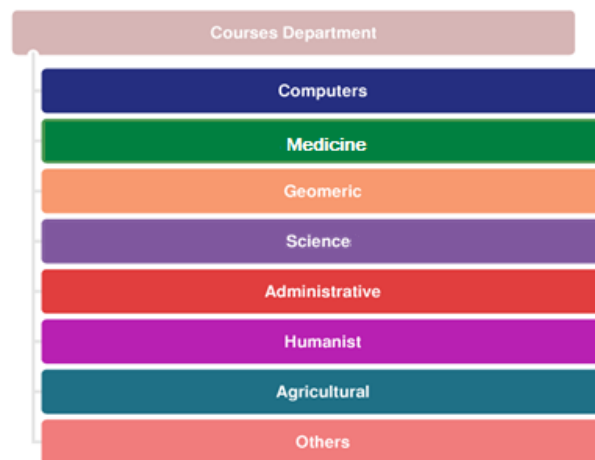


Figure (2): The eight competences in the RDD MOOC system

After determining the main departments that should include in the MOOC system, it is important to drawing a wireframe of the courses, first drawing the wireframe to the overall structure of one course in general, as shown in figure(3).

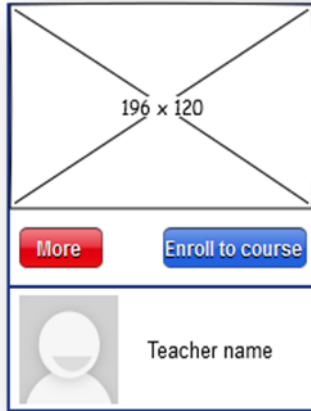


Figure (3): The wireframe of a single course structure

Furthermore, the design of the course outline is defined to show students of what exactly topics they will be covering in a study course. A course outline expresses everything that will occur during a course, for example, lecture, test, and deadlines will be incorporated. The course outline typically includes what textbooks will be required, and what will be educated throughout the course of the class. The course outline will help the students assess their readiness for the course by identifying precondition parts of knowledge (Morris, 2009). The course outline of proposal system includes the following components (see table (1)):

Table (1): The components of the course outline.

component	The reason for added this component
Course name	In order to determine the title of the topic to the learner.
About Course	To give a brief summary of the course: scope, purpose, and importance of the material.
Instructor name	To define the name of the instructor who explains the course.
About instructor	To know the experience and competence of the instructor.
Syllabus	To lists the course objectives, schedule and defines the detailed course content.
Material requirements	What are the experiences that should you know to enroll in this course.
Course image	Expressive image about the course.
Date	It contains the start date and end date of the course (course timeline).
Resource	List of information pages or resource important for the course.

All previous components must be available in each course before enrolling student to determine whether this course is appropriate to the needs, experiences and the desire of the learner, as shows in figure (4).

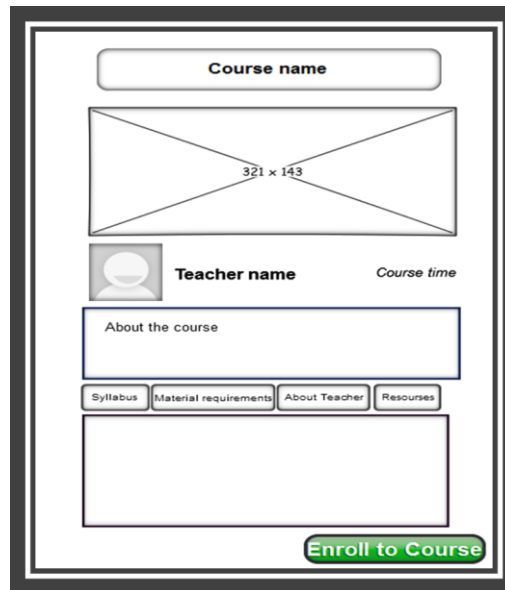


Figure (4): The wireframe of the course outline

The step now is to design the content of each course. Splitting the course into weeks, short modules, every week in the course includes a lecture and every lecture in each week focus on a particular subject. Different tools and technologies should be used to ensure the understanding of the lecture. So that the instructor can create the contents in different ways to explain the lecture for students, where each lecture can contain text, video, images, URL, document and discussion, as shown in table (2). It is also able to embed video from YouTube. Even if there are an enormous number of visitors to website to view videos, YouTube will pay for the bandwidth.

Table (2): Overall structure of each lecture in the course

<i>Week 1</i>						
Introduction	Text	Video	Image	URL	Document	Discussion

Moreover, the student (who reads the course components and wish to enroll in the course) can enroll easily by logged in the MOOC system successfully. The enrolled student is able to watch and study the lectures of each course anytime and anywhere.

Development phase

This phase depends on the previous two phases, which means if these phases did correctly the development phase will be easier. The development stage starts the creation and testing of the methodology that used in the project. At this phase, the proposed design is practically realized and the system is physically produced, this is done by convert contents and designs into codes. In order to perform this process some toots, programs, and languages should be used. So the Dreamweaver program is used as an editor to write code to the MOOC system as well as used Apache Server to allow simply test their scripts and programs before they put them "live" on the Internet.

Afterward, to accomplish this phase three steps should be followed(Panta, 2009):

- The first step involved the implementation of client side scripting by using HTML5 and CSS3 Language in addition to JavaScript, JQuery, and Bootstrap(Barman, 2001). These Languages provide the basic structure, style information, layout, look and feel that built on the MOOC system. Nevertheless, in this steps, the contents and information in the platform will remain constant. So moved on to the next step is important.

- The second step is a server side scripting, this step implementation by using PHP Language in order to convert the platform from static to dynamic contents. After completing the previous two steps, the system needs a database to store the information such as text, images, files, video, document and other data.
- So the third step is database technologies which are carried out by using MYSQL where is the standard language of accessing databases and manipulating it.
-

Registration process in the MOOCs system

In this section, the user registration and the login process in the MOOC system is explained. Therefore, a flowchart is used to illustrate the whole steps that the user should complete it to successfully login in the system (see figure (5)). The flowchart explains that the log in process includes two cases:

- The first case, if the user is not registered in the system and in order to register should determine whether this account for instructor or student because the system gives different permissions to each one. Then, the user should enter the required information and after the system confirmed the validity of this information the user can be successfully login to the system.
- The second case, if the user previously registered but he not login in the system and in order to login should enter the username and password, if the username and password that entered match the username and password that previously stores in the database will start a session that allows user to access home page otherwise it will show an error message. Session plays important role in this type of system, for that PHP session are used to keep user login status. Since the user uses the session the login status of his will still keep and for canceled should destroy the current logged in. So the session can destroy only by clicking on the logout and after destroying the session the system automatically redirects to the login page.

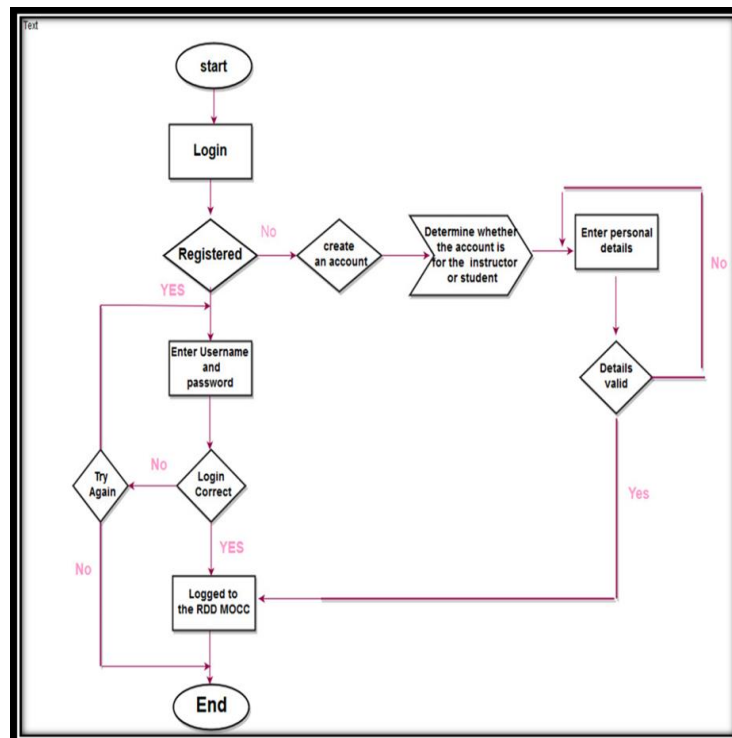


Figure (5): Login flowchart

How to enrollment in Courses

In this section, the process of how the student can be enrollment in the course will be explained by using a flowchart. So in order the student be able to enroll in a course should follow these steps, as shown in figure (6):

- The student must select the course that he find it like his desire after reading the course information (course syllabus) by clicking on the “More” button..
- Click “enroll to course” button.
- After that, if the student registered in the system he can view the course lectures directly, but if he doesn’t have an account the system will transmission him to the registration page and after the registration process is complete he can viewing the course lecture successfully.

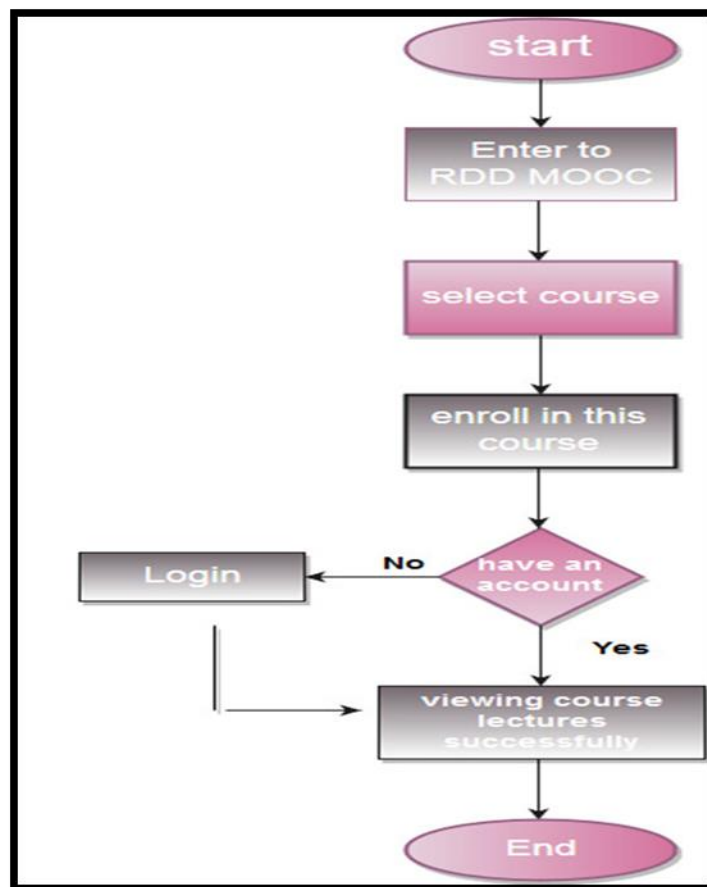


Figure (6): Enrollment in courses flowchart

What is the role of each user who interacts with the system?

Since the MOOC system have three types of users who interact with the system (admin, instructor, and student) so that each one has different levels of access (different authorization) to the system. Therefore, each one has different role in the system and in order to identify this role a use case diagram is used(Xiao & Pardamean). Use case diagram is a graphic depiction of a list of actions or event steps, usually defining the interactions between a user (actor) and a system(Gautam, 2015). Furthermore, to draw a use case diagram a “draw.io” (it is free online diagramming software) is used because it have a lot of flexibility that facilitates a drawing more easily and quickly. So figures (7), (8) and (9) represents a use case diagram for student role, instructor role, and admin role.

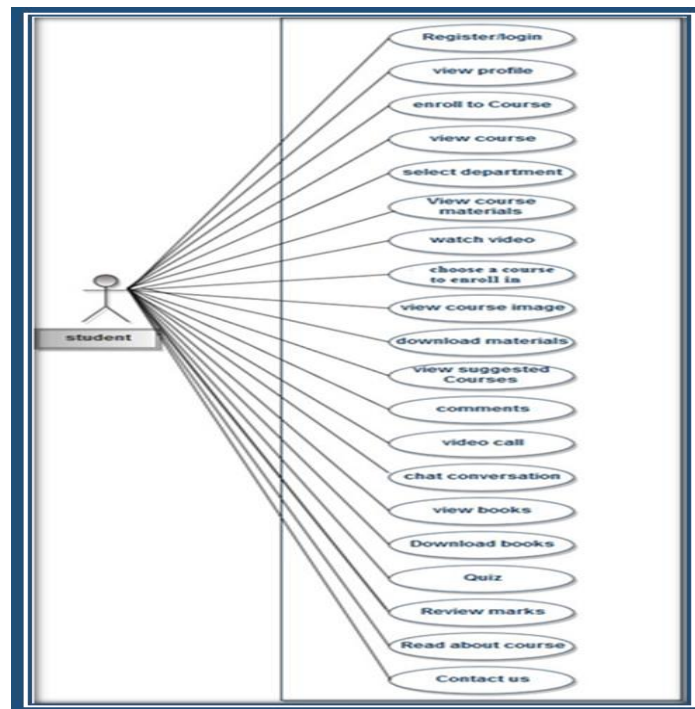


Figure (7): Use case diagram for the student Role.

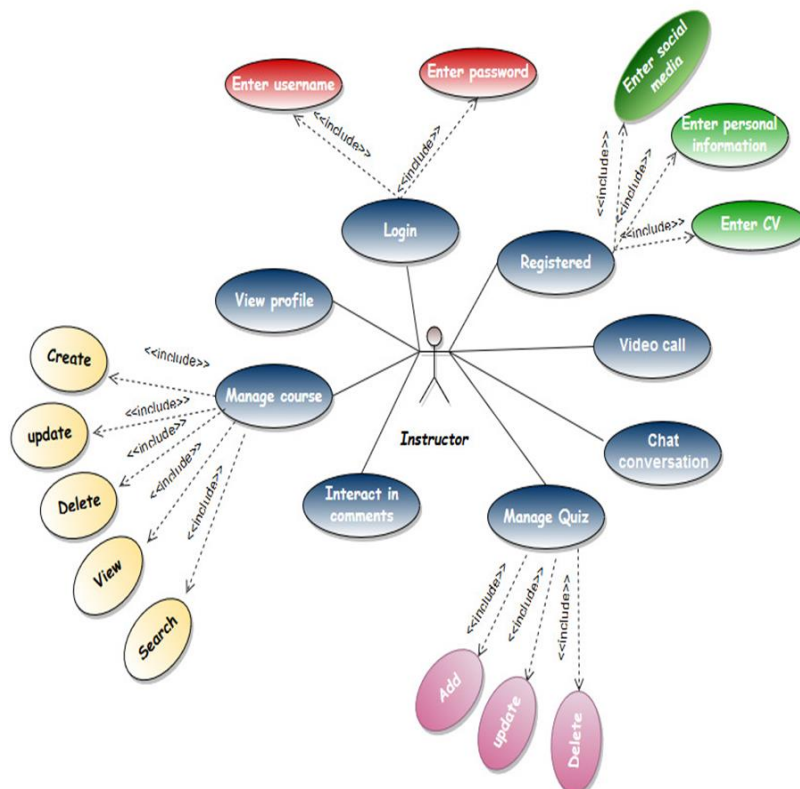


Figure (8): Use case diagram for the Instructor Role.

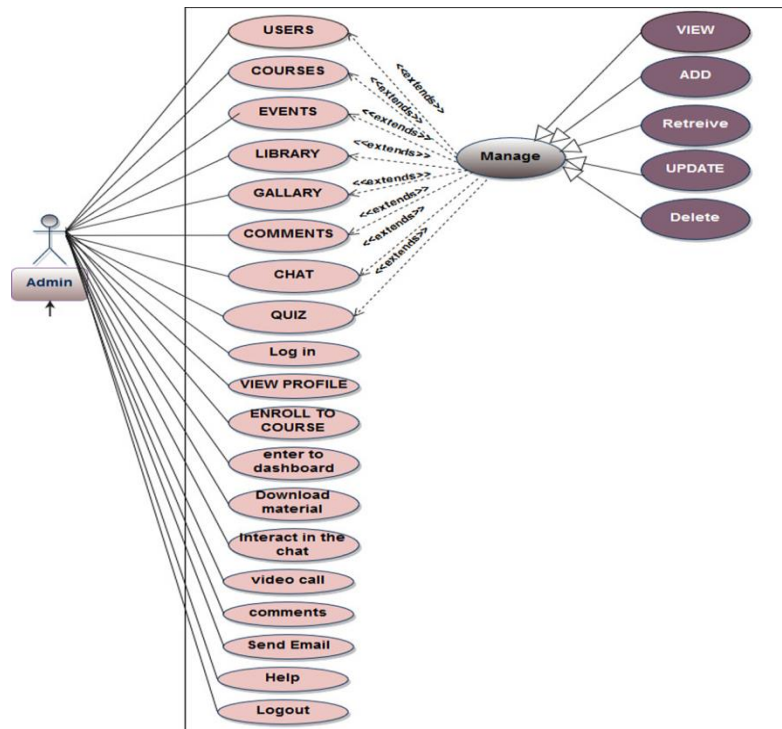


Figure (9): Use case diagram for the Admin Role.

Implementation phase

In the implementation phase, the plan (strategy) is converting into action and this is done by making the proposal system accessible to everyone. Therefore, in order to do that, a web hosting Servers is required. Web hosting is the service that makes a site accessible to be seen by any users associated with the internet. So to find an appropriate hosting to a platform some requirement should be analysis, such as “what features and functions are good-to-have in a hosting”.

Furthermore, the proposal system required a Domain Name System (DNS) to translate host names into equivalent IP addresses in order to reach the system.

So to determine a domain name should take into account it composed of several different parts which are:

- Sub domain: By agreement this is www – but can be altered.
- Second-level domain name: This is frequently the name of the website.
- Top-level domain name: This can involve.org, .com, .net, etc.

After determining the requirements that should available in the hosting of the MOOC system and identify the domain name that will be used in the system, the ALSICO Company is choosing as a hosting. Therefore, for transferring the MOOC files from computer to remote hosting, FTP server is required. The File Transfer Protocol (FTP) is a standard network protocol utilized for the transfer of PC files from a server to a client by using the Client-server model, on a computer network.

Evaluation phase

The last process in ADDIE model to building the proposal MOOC system is the Evaluation phase. It is very important to evaluate each step in order to make sure that we achieve the goals. This step is significant because it helps in distinguish the weak, good steps and also those need to be updated. In this phase, we measure the effectiveness and efficiency of the project. Evaluation should essentially occur through the process - within phases, between phases, and after implementation. The evaluation may be Formative or Summative (Braxton, Bronico, & Looms, 2006).

Formative evaluation: starts through project development and continues during the life of the project. Its intent is to measure ongoing project activities and provide data to monitor the progress of the project. From this point, the information gathered throughout this stage are of huge value and need to be followed via instant adjustments and changes. The formative evaluation may assistance to determine weak spots in different areas of the process and consequently increase the worth of the final project.

Summative Evaluation: typically occurs after the final version of the project is implemented. This type of evaluation measures the overall effectiveness of the education. Information from the Summative Evaluation is frequently used to create a decision about the project.

CONCLUSIONS

In this paper, we have present a methodology to design and constructing a mooc system. These methodology relying on the ADDIE model. Where the ADDIE based on five stage which is: the analysis, design, development, implementation and evaluation. The outcome that will gain after applying these five steps is having a complete MOOC system that considers a much easier way of learning than traditional education because it delivers the courses online for any person with no worry on the physical attendance, also are able to deliver classes without regard for geographical boundaries.

REFERENCES

- Ahmadpour, A., Mirdamadi, M., Hosseini, J. F., & Chizari, M. (2010). Factors Influencing the Design of Electronic learning system in Agricultural Extension. *American Journal of Agricultural and Biological Sciences*, Vol.5 , No.2, pp. 122-127 , from <http://www.scipub.org/fulltext/AJAB/AJAB52122-52127.pdf>.
- Ahmed, T. T. (2011). Evaluating e-learning Effectiveness in Higher-education Institutions at Developing Countries: An Empirical Study and Proposed Model. Paper presented at the Second International Conference on e-Learning and Distance Learning (eLi 2011) 21-24 Feb ,Riyadh , KSA from [http://eli.elc.edu.sa/2011/sites/default/files/slides/Prof.Dr_.Tarek%20Taha%20Presentation\(P\)_0.pptx](http://eli.elc.edu.sa/2011/sites/default/files/slides/Prof.Dr_.Tarek%20Taha%20Presentation(P)_0.pptx)
- Barman, H. (2001). Using Web Design Techniques and Tools in Developing Mathematical Software and Applications. Tezpur University.
- Braxton, S., Bronico, K., & Looms, T. (2006). Instructional system design (ISD): using the ADDIE Model. College of Education, Penn State University. Retrieved March, 22, 2006.
- Billington, P. J., & Fronmueller, M. P. (2013). MOOCs and the future of higher education. *Journal of Higher Education Theory and Practice*, 13(3/4), 36.
- Gaebel, M. (2014). MOOCs: Massive open online courses: EUA.
- Gautam, R. K. (2015). MIS for Blended MOOCs on IITBombayX. Indian Institute of Technology Bombay.
- Greener, S. (2010). Staff who say no to Technology Enhanced Learning. Paper presented at the The 5th International Conference on e-Learning , 12-13 July , pp.134-139, Penang , Malaysia.
- Danks, S. (2011). The ADDIE model: Designing, evaluating instructional coach effectiveness. *ASQ Primary and Secondary Education Brief*, 4(5), 1-6.
- Elameer, A. and R. M. Idrus (2011). "Elameer-Idrus Orbital E-Education Framework For The University Of Mustansiriyah (Uomust)." *The Turkish Online Journal of Educational Technology – TOJET* 10(4-16).
- Morris, J. (2009). Guide to the.
- Koutropoulos, A., & Hogue, R. J. (2012). How to Succeed in a MOOC-Massive Online Open Course (Oct 12).*
- Khan, B. H. (2009). E-Learning - The Global e-Learning Framework. In S. Mishra (Ed.), STRIDE Handbook 8 (Vol. 1, pp. 42-52 (Chapter Five)). New Delhi , India: The Indira Gandhi National Open University (IGNOU) , from http://www.ignou.ac.in/institute/STRIDE_Hb8_webCD/STRIDE_Hb8_Full.*
- Kirkland, J., & Bimler, D. (2010). Beyond others' landmarks there is territory to map and discoveries to be made within knowledge communities. Paper presented at the 3rd International Conference and Exhibition on "The Role of e-Learning in Supporting Knowledge Communities" from 6-8 April, University of Bahrain, Bahrain. from www.econf.uob.edu.bh/regApp/participants/papers/econf3%200079.doc
- Reich, J. (2015). Rebooting MOOC research. *Science*, 347(6217), 34-35.
- Robbins, J. N. (2012). Learning web design: A beginner's guide to HTML, CSS, JavaScript, and web graphics: " O'Reilly Media, Inc."
- Panta, P. (2009). Web Design, Development and Security. Youngstown State University.
- Xiao, F., & Pardamean, B. MOOC Model: Dimensions and Model Design to Develop Learning. *Stanisław Juszczak*, 28.

Flipped Learning for Esl Writing in a Sudanese School

Limia Ali Mohamed ABDELRAHMAN

aroosalremal@hotmail.com

*Faculty of Education, University of Malaya
Malaysia*

Dorothy DEWITT

dorothy@um.edu.my

*Faculty of Education, University of Malaya
Malaysia*

Norlidah ALIAS

drnorlidah@um.edu.my

*Faculty of Education, University of Malaya
Malaysia*

Mohd Nazri ABDUL RAHMAN

mohdnazri_ar@um.edu.my

*Faculty of Education, University of Malaya,
Malaysia*

ABSTRACT

This paper is a report on the use of the flipped learning (FL) approach of using online videos as homework before class, followed by learning activities during class, to address the issue of the lack of proficiency in writing among Sudanese students. A module for teaching English paragraph-writing for Secondary Year 1 was developed and implemented. The 28 students who volunteered were divided into two groups and the effects of this module on the students' writing proficiency and their satisfaction with the module was investigated. Data was collected from tests, focus group interviews and online interactions. Analysis showed that students' writing proficiency had improved and the students were satisfied using the module. Further studies should be done to investigate the possibility of using the FL module on a larger scale in Sudan.

INTRODUCTION

English language proficiency is necessary to ensure the economic and educational success of a nation (McKay, 2005). Specifically, writing in English is required for correspondence both for work and for personal interactions. Hence, the need to master English as a second language (ESL) is crucial for Sudan. However, Sudanese students' proficiency in English is still below expectation (Ministry of Education (MOE), 2012). Studies indicate the majority of the Sudanese ESL learners are not competent in communicating, specifically when writing (Alwasilah, 2006; Hajana, 2006; Makki, 2005; Nur, 2012). Sudanese ESL learners in Sudanese universities also have problems in communication (Yong, 2012). The lack of ESL writing proficiency might be because learners have not had sufficient preparation (Al-Khsawneh, 2010; Makki, 2005). In Sudan, Arabic is the first language and ESL is taught only from Grade 5 in the basic, or primary school (Arora, 2003).

This problem could be due to ineffective methods for teaching ESL writing skills at both the basic and secondary schools (Minister of Education, 2012). Passive learning experiences and the inefficient traditional teaching practices contribute to the lack of writing skills (Mack, 2012; Philips, 2012). In addition, there was little opportunity to communicate in English in authentic real world situations (Alhaj, 2005; Munhal, 2009; Sarwar, 2000). A product-based approach of memorizing grammatical structures, vocabulary, and specific written texts for passing examinations was employed (Cronje, 2006; Makki, 2005; Nur, 2012). Hence, research to determine models of instruction which can enhance the teaching of ESL writing are required (Keshta & Harb, 2013).

Technology-enriched and innovative teaching practices can contribute to the improvement of ESL students' proficiency (Baffoka, 2012).

The flipped learning (FL) model may be a solution for improving writing as there has been some studies on FL in English writing, but more studies are required to investigate the use of this model in secondary schools for improving ESL writing (Flumerfelt, & Green, 2013). Further, there does not seem to be any study on FL in Sudanese schools. Therefore, the purpose of this study is to investigate whether an instructional module developed with the FL model could improve Sudanese students' paragraph-writing skills in ESL. The research questions are: What are the effects of FL on Secondary 1 Sudanese students' achievement in ESL paragraph-writing in a Sudanese Secondary School in Qatar? What are the students' satisfaction with FL through their engagement and interaction?

This study is significant to teachers in Sudanese schools to determine the effects of FL, and how it can be implemented in schools for active learning beyond using the textbooks alone. Researchers will benefit from the determining whether FL could solve the problems of ESL learning in Sudanese schools. In addition, policy makers could use these findings to plan teacher-training and the implementation of the new ESL curriculum for the improvement of instructional practices in Sudanese schools. Further, this study may help curriculum planners to consider the technology to be integrated in teaching.

LITERATURE REVIEW

A blended-learning approach is more suitable for teachers used to working in traditional classrooms but want to use digital technologies for teaching (Motteram & Sharma, 2009). Blended learning assumes that the face-to-face teaching continues, but is enriched with technology (Marsh, 2012). However, suitable activities need to be designed (Motteram & Sharma, 2009). FL is a blended-learning model (Milman, 2012). The usual classroom is flipped as students watch and interact with video lessons outside the classroom, and then use class time for engaging activities facilitated by the teacher (Love, Hodge, Grandegenett & Swift, 2013). When class work is done prior to class, while homework is done in the classroom, it frees the class time giving more time for active learning (Bergmann & Sams, 2012; Pierce, 2013). At the same time, the learning environment can be enriched with creative learning activities that enhance students' learning and develop their skills (Keshta & Harb, 2013). This means that FL can be used to enrich a passive learning experience and the use of traditional teacher-centered approach in teaching ESL in Sudanese schools. The teacher can then focus on the development of ESL writing skills during class time as technology and FL enables teaching to extend outside the classroom. There still seems to be little research on the FL model of instruction (Johnson & Renner, 2012; Strayer, 2007). FL may be suitable for certain subjects such as science (Ruddick, 2012; Snowden, 2012; Torkelson, 2012) and mathematics (Clark, 2013; Strayer, 2007; Snowden, 2012). However, there are also some studies for English instruction (Baranovic, 2013; Snowden, 2012). However, most of these studies seem to be done in higher education (Baranovic, 2013; Pierce & Fox, 2012; Ruddick, 2012; Strayer, 2007; Zappe, Leicht, Messner, Litzinger Lee, 2009). However, research seems to suggest that FL can support students' active and meaningful learning through the building of social skills in group activities and interactions with effective use of technology (Strayer, 2007). Most of these studies show that FL improved achievement and satisfaction (Baranovic, 2013; Clark, 2013; Pierce & Fox, 2012; Ruddick, 2012; Torkelson, 2012). On the other hand, some studies show that students' satisfaction was lower with FL (Johnson & Renner, 2012; Strayer, 2007). Hence, there needs to be more research on the implementation of FL in secondary schools, and specifically for English writing.

In this study, students' satisfaction will be measured through students' engagement and interaction (Dziuban, Moskal, & Hartman, 2005). Engagement results in increased achievement, positive behaviours, and creates a social environment with interactivity among students, both in and outside the classroom (Taylor & Parsons, 2011). There are three types of engagement: social engagement, which is interest, the sense of belonging and participation in the learning environment; cognitive engagement, which refers to doing tasks on time, and responding to challenges in learning; and behavioral engagement, which refers to attendance rate, as well as willingness to learn difficult tasks (Willms, Friesen, & Milton, 2009; Reeves, 2013). There are three types of interaction in the learning environments: teacher-learner, learner-learner, and learner-content interactions (Moore, 1989). Moore (2013) stated that the learner who expects moderate or high level of interaction in his learning environment, might be very dissatisfied if experiences no learning interactions.

THE STUDY

An exploratory-implementation study to investigate the effects of a module for teaching paragraph-writing for ESL using the FL approach (the PW module) in a Secondary One class of Sudanese students (DeWitt, Alias and Siraj, 2014). The study was implemented in a Sudanese secondary school in Qatar, one of the Schools of Sudanese Community Abroad (SCA). The curriculum and the learning environment in SCA schools is similar to schools in Sudan. A SCA school was selected for this study as it is believed that the teachers and students in this type of school may be more receptive to the possibility of implementing the FL. In this study, a SCA secondary school for girls in the State of Qatar with an enrolment of 250 Sudanese students was selected. This school is considered a typical Sudanese school in terms of infrastructure, where children of Sudanese expatriates working in Qatar are enrolled.

There were two Secondary One classes with 30 students each. One of the classes was randomly selected for the intervention with the PW module, while in the other class, the traditional approach was used. The sample consisted of 14 student volunteers from each of the two classes who had their parents' permission to participate in the study. The PW module was implemented for four weeks. Pre and post tests were used to determine students' performance in the two groups, followed by a focus group interview with 6 students who used the module to gather information on students' satisfaction with the PW module. The pre-test assessed the students' ability to write a 100-word descriptive paragraph on their best friend and the post-test was a similar writing task for on their favorite person. These tests were validated by two experienced teachers. The students' writing compositions were assessed by two expert teachers, based on a rubric. The assessment scores between the two assessors were compared and moderated to ensure inter-rater reliability was maintained (Seliger & Shohamy, 2000). The pretest and post-tests scores were analyzed using t-tests to determine whether there was any significance difference in students' achievement before and after the intervention. Data collected through the focus-group interviews and postings on the online forum were used to determine the students' attitudes in a non-threatening environment so that students would be willing to share their feelings (Naimie, Chin, Dewitt, Akma & Mohajer, 2013). Participants were interviewed in Arabic, their first language, and the interview was audio recorded, transcribed and translated into English. Directed content analysis was carried out to determine engagement and interaction.

The PW module consisted of four lessons for four weeks. The module was designed to provide the knowledge and skills required to write descriptive paragraphs in English. Each lesson comprises of two modes of instruction: the online instruction, which was an instructional video, and face-to-face instruction of 40 minutes duration in the classroom lesson. The learning management system, "Edmodo", was used as the platform for the online learning environment. The videos were 10-minute duration, accompanied by questions, which were posted to encourage students to reflect upon the knowledge and skills learnt from the videos. The face-to-face instruction in class used discussions and questions, exercises and quizzes, individual and group writing tasks on worksheets and hand-outs.

FINDINGS

Effect on achievement

The results of the independent-samples t-test indicate that the pre-tests scores in paragraph-writing was not significantly different between both the intervention and non-intervention groups, where $t(19.288)=1.520$, $p > .145$. However, there was a significant difference between both groups in the post-test scores where $t(16.409)=2.977$, $p < .009$. The post test scores for paragraph-writing in the intervention group was significantly higher (Mean =11.14, S.D.= 4.975) compared to the non-intervention group (Mean = 6.93, S.D.= 1.817). When tested for equality of variances using Levene's test, the test was significant ($p=0.001$), with unequal variances for the non-intervention and the intervention group (Meier, Brudney & Bohte, 2009). Hence, the PW module seemed to be effective in developing paragraph-writing skill of students in the intervention group.

Evidence from the focus group interview and the online discussion showed the effectiveness of the module. Student A said: "This really helped to improve my English writing skill. After this experience, I realized that writing is a very important." The effectiveness was attributed to the online video lessons which enabled better understanding. Student D stated, "I found that I can understand better from the online video lesson than from reading the textbook."

The students gained knowledge and skills as evidenced by student C: “We are more aware about grammar, mechanics, types of paragraphs, and other aspects. We are also able to evaluate each others’ writing.” Student C also said, “I got the full marks in the English mid-term exam. I attribute this to my learning experience with the PW module.” The students agreed that this module was beneficial and improved their performance. Hence, they perceived that FL was effective for learning paragraph writing in ESL.

Students’ Satisfaction

Engagement

The students were engaged socially when using the module. There were more social interactions. Student C noted “the class is more active and interactive with this method.” The social interactions were stimulating and engaging. The online video lessons prior to class time may have led to the increase in classroom interaction. Student C shares, “I interact more in class because I come to class with background knowledge on the new lesson.” The participants felt that they were able to share what they learned from the video lesson better. Student C added “We are more cooperative and we share on the lesson.” Student D concluded “I feel that we become closer than before.” The researcher also observed that the students were excited and willing to share their knowledge during class time as compared to the non-intervention group. Hence, there was social engagement with the use of the PW module.

Students also responded to the challenges in learning and completed the tasks, indicating cognitive engagement (Willms, Friesen and Milton, 2009). Student A shared, “My teacher and I were able to detect my weaknesses in the language. This is a result of having enough class time to work together. Thus, I work hard to overcome my problems.” They were satisfied with their performance in writing at the end of the intervention. Student D stated “I am happy because finally I can write a paragraph in English with minimum mistakes”. Moreover, observations showed that the students were enthusiastic in responding to teachers’ questions during class as they were actively thinking and cognitively engaged when using the module.

The students also exhibited behavioural engagement as they were positive towards using the PW module. They were more confident in writing. Student B shared, “Before using the module, English was the most difficult subject in school. I don’t write because I am weak in English. Now, I am completely changed. I am more confident in using and writing English, even outside school.” Student H stated in the online forum “Learning English has becomes much easier.” The students were able to take responsibility of their own learning even when the teacher was not available. In her online response, student G stated “Now writing becomes much easier than before, and we are able to assess our own work. Previously, we waited for the teacher’s corrections to decide how we performed.”

Finally, all participants were positive about the online lessons for building their prior knowledge before class. In addition, they performed better in their learning activities during class time and were more confident in learning paragraph-writing.

Interaction

During the implementation of the PW module, there were many teacher-learner interactions. The students believed their teacher was paying more attention to them. Student D stated “With the module, homework is done in class and we had the chance for the teacher to answer our questions.” In the online forum Student G also wrote “It is really a great idea to come the next day to class and do the homework with the help of the teacher and the other students. So, the class time becomes enough for completing our tasks.” The students were satisfied by the role played by the teacher during the lesson as compared to the traditional process of delivering lectures had been replaced with more interactive group work and discussions. Student D, said, “With the traditional teaching, the teachers explain the lesson in class and then assign homework for us to do at home. Unfortunately, at this point we face many difficulties in doing the homework by ourselves. Moreover, when we come the next day to seek help from the teacher, we are faced with the limited class time. The teacher won’t be able to discuss the difficult points with us as she has to start a new lesson.” Hence, this indicates that there was more interaction with the teacher in the classroom. As Student C says, they “work together to complete the tasks.”

There were also many learner-learner interactions as students interacted actively in the classroom, and online (Moore, 1989). However, there were very few online interactions as students answered the teacher’s questions directly without any further discussion.

This might be due to the students' language barrier. However, it was noted that shy students responded to questions in the online forum. In conclusion, there were interactions among the students, both online and face to face, with more interactions during the face-to-face session in the classroom.

There was learner-content interaction as students were engaged with the video lessons (Moore, 1989)

Student D "I can understand better from the online lesson than reading the textbook. The content in the video lessons is totally different from the textbook. The textbook is in black and white, which is very boring. The videos are more interesting." In general, the students were satisfied as they interacted with the EPW module, with the teacher, and among themselves. Student G responded "I am very satisfied with my learning experience with flipped learning." Student A suggests, "I would like to continue learning with this method. I really prefer if it can be used in all the other school subjects." Student G also wrote in the online forum "I hope that all the teachers of the other subjects implement this method of teaching."

CONCLUSIONS

The PW module seems to be effective in improving Sudanese students' achievement in writing. This could be attributed to the FL concept (Bergmann & Sams, 2012; Pierce & Fox, 2012; Ruddick, 2012). These students were non-native speakers of English but improved in their writing with the use of FL (Baranovic, 2013). However, it is not known if there were other contributory factors besides FL (Clark, 2013).

The students were satisfied with the PW module as they were engaged and were actively interacting (Dziuban, Moskal, & Hartman, 2005). Students were engaged with FL approach. The social engagement improved the sense of community among the students, and they were cognitively and behaviourally engaged as they responded to the challenges in the activities (Taylor & Parsons, 2011). This is consistent with other studies which indicated that FL engaged learners (Pierce & Fox, 2012; Zappe et al., 2009).

Student interactions among other students, the teacher and the content had increased with FL (Moore, 1989). This was similar to other studies (Snowden 2012; Torkelson, 2012), and contradicts Strayer's (2007) findings that students are unsettled while doing the activities. This might be due to the structured presentation of content and activities before class in the PW module (Strayer, 2007). There was more teacher-learner interactions with the FL as the teacher could give more attention to the students and attend to their learning needs (Snowden, 2012).

Hence, FL using the PW module seemed to be effective for improving students' achievement in writing. The students were satisfied as they were engaged with the module and that student interactions were increased. However, further studies could be done to investigate whether Sudanese learners in different contexts and with different subjects, might find the FL beneficial (Pierce & Fox, 2012). In addition, further the guidelines and support that are required for teachers to effectively implement the FL approach.

The study has several limitations and its findings cannot be generalized to all Secondary One students in Sudan. The current study only focused on writing descriptive paragraphs and did not include other communicative skills which may be required for writing. In addition, this is an exploratory-implementation study with a small sample of students, and was only conducted for a period of one month. The study did not take into account teachers perceptions, which is important. Hence, in future, studies should be conducted in other Sudanese schools, and for teaching other components in ESL, to determine if the FL would have similar results. A more rigorous study with a larger sample could be used to determine whether FL could be effective for learning ESL writing.

REFERENCES

- Alhaj, M. D. (2005). The Problem of Fluency in Spoken English Among Students Majoring in English in Sudanese Universities. (Unpublished doctoral dissertation). University of Khartoum, Sudan.
- Al-Khasawneh, F. M. (2010). Writing for academic purposes: problems faced by Arab postgraduate students of the College of Business. *ESP World*, 9(2), 1-23.
- Alwasilah, A. C. (2006). From local to global: reinventing local literature through English writing classes. *TEFLIN (The Association of Teachers of English as a Foreign Language in Indonesia) Journal*, 17(1), 11-24.
- Arora, G. L. (2003). *Sudan basic education sub-sector study: Analysis of curriculum and suggestions for national curriculum framework*. Khartoum, Sudan: UNESCO.

- Baffoka, M. B. (2012). Changing teachers' views about teaching and learning: A pre-requisite for improving ELT and student proficiency in English in Sudanese universities. *Time for Change: Developing English Language Teaching at Tertiary Level in Sudan*, 53-61.
- Baranovic, K. (2013). *Flipping the first-year composition classroom: slouching toward the pedagogically hip*. (Unpublished master thesis). Southeast Missouri State University, Missouri.
- Bergmann, J. & Sams A. (2012). *Flip Your Classroom: Talk to Every Student in Every Class Every Day*. Alexandria, VA: ISTE and Association of Supervision and Curriculum Development (ASCD).
- Clark, K. R. (2013). *Examining the effects of the flipped model of instruction on student engagement and performance in the secondary mathematics classroom: An action research study*. (Published doctoral dissertation). Capella University Minneapolis.
- Cronje, J. C. (2006). Pretoria to Khartoum: How we taught an internet-based Masters' programme across national, religious, cultural and linguistic barriers. *Educational Technology and Society*, 9(1), 276-288.
- Naimie, Z., Chin, H. L., DeWitt, D., Akma, N., & Mohajer, L. (2013). Interview. In S. Siraj, N. Alias, D. DeWitt & Z. Hussin (Eds.), *Design and Developmental Research: Emergent Trends in Educational Research* (pp. 50-59). Kuala Lumpur: Pearson Malaysia.
- Dziuban, C., Moskal, P. & Hartman, J. (2005). Higher education, blended learning and the generations: Knowledge is power-no more. In J. B. Moore (Ed.), *Elements of quality online education: Engaging communities* (pp. 85-100). Needham: MA: Sloan Consortium.
- Flumerfelt, S., & Green, G. (2013). Using lean in the flipped classroom for at risk students. *Educational Technology & Society*, 16 (1), 356–366.
- Keshta, A. S. & Harb, I. I. (2013). The effectiveness of a blended learning program on developing Palestinian tenth graders' English writing skills. *Education Journal*, 2(6), 208 - 221
- Hajana, O. H. (2006). *The relationship between grammatical competence and writing quality*. (Unpublished master's thesis). University of Khartoum, Sudan.
- Johnson, L. W., & Renner, J. D. (2012). *Effect of the flipped classroom model on a secondary computer applications course: student and teacher perceptions, questions and student achievement*. (Doctoral dissertation). University of Louisville, Kentucky.
- Keshta, A. S. & Harb, I. I. (2013). The effectiveness of a blended learning program on developing Palestinian tenth graders' English writing skills. *Education Journal*, 2(6), 208-221.
- Love, B., Hodge, A., Grandgenett, N., & Swift, A. W. (2013). Student learning and perceptions in a flipped linear algebra course. *International Journal of Mathematical Education in Science and Technology*, 1-8.
- Mack, L. (2012). Towards ELT-based co-operation between tertiary-level institutes and employers. *Time for Change: Developing English Language Teaching at Tertiary Level in Sudan*, 26-31.
- Makki, F. A. (2005). *An error analysis study on expressive literary writing of Sudanese secondary students in Khartoum State*. (Unpublished master's thesis). University of Khartoum, Sudan.
- Marsh, D. (2012). *Blended Learning: Creating Learning Opportunities for Language Learners*. New York, NY: Cambridge University Press.
- McKay, S. L. (2005). Teaching the pragmatics of English as an International Language. *Guidelines*, 27(1), 3-9.
- Meier, K. J., Brudney, J. L., & Bohte, J. (2009). *Applied Statistics for Public and Nonprofit Administration*. 7th. Ed. New York: Wadsworth Cengage Learning
- Milman, N. B. (2012). The flipped classroom strategy: What is it and how can it best be used. *Distance Learning*, 85-87.
- Minister of Education (2012). *English Language Curriculum Reform Programme*. Ministry of Education, Sudan. Retrieved from: <http://www.moe.gov.sd/>
- Moore, M. (1989). Three types of interaction. *American Journal of Distance Education*, 3(2), 1-6.
- Moore, M. G. (2013). *Handbook of Distance Education* (3rd ed.). USA: Edwards Brothers, Inc.
- Motteram, G. & Sharma, P. (2009). Blending learning in a web 2.0 world. *International Journal of Emerging Technologies & Society*, 7(2), 83-96.
- Munhal, E. A. (2009). *An Evaluation of Techniques and Strategies Adopted by BNS Secondary School Teachers to Develop Their Students' Oral Fluency in English Language*. (Unpublished doctoral dissertation) University of Khartoum, Sudan.

- Nur, H. S. (2012). Time for change: Developing English Language teaching at tertiary level in Sudan. *Time for change: Developing English Language Teaching at Tertiary Level in Sudan* (pp. 9-11). Khartoum, Sudan: Garnet Education.
- Philips, T. (2012). What English do university students really need? *Time for change: Developing English Language Teaching at Tertiary Level in Sudan* (pp. 32-34). Khartoum, Sudan: Garnet Education.
- Pierce, R. (2013). Student performance in a flipped class module. *Society for Information Technology & Teacher Education International Conference* (pp. 942-954). Chesapeake: VA: AACE.
- Pierce, R., & Fox, J. (2012). Vodcasts and active-learning exercises in a “flipped classroom” model of a renal pharmacotherapy module. *American Journal of Pharmaceutical Education*, 76(10).
- Reeve, J. (2013). How students create motivationally supportive learning environments for themselves. *Journal of Educational Psychology*, 105(3), 579.
- Ruddick, K. W. (2012). *Improving chemical education from high school to college using a more hands-on approach*. (Unpublished doctoral dissertation, University of Memphis).
- Sarwar, Z. (2000). Project-based Learning. In L. T. Diaz-Rico (Ed.), *Strategies for Teaching English Learners* (2nd. ed., pp. 393-394). USA: Pearson Education, Inc.
- Seliger, H. W. & Shohamy, E. (2000). *Second Language Research Methods*. Oxford: Oxford University Press.
- Snowden, K. (2012). *Teacher Perceptions on the Flipped Classroom: Using Video Lectures Online to Replace In-class Traditional Lectures*. (Published master dissertation, University of North Texas).
- Strayer, J. F. (2007). *The effects of the classroom flip on learning environment: A comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system*. (Doctoral dissertation, The Ohio State University).
- Taylor, L. & Parsons, J. (2011). Improving student engagement. *Current Issues in Education*, 14(1), 1-32.
- Torkelson, V. (2012). *The Flipped Classroom: Putting Learning Back into the Hands of Students*. (Published master dissertation, Saint Mary College of California).
- Willms, J. D., Friesen, S., & Milton, P. (2009). *What did you do in school today? Transforming classrooms through social, academic and intellectual engagement (First National Report)*. Toronto: Canadian Education Association.
- Yong, T. J. (2012). English for the workplace: Giving students language skills for future employment. *Time for Change: Developing English Language Teaching at Tertiary Level in Sudan* (pp. 62-65). Khartoum: Garnet Education.
- Zappe, S., Leicht, R., Messner, J., Litzinger, T., & Lee, H. (2009). Flipping the classroom to explore active learning in a large undergraduate course. *Proceedings of the 2009 American Society for Engineering Education Annual Conference and Exhibition*.

Flipping the Classroom through the Use of Socrative, Padlet, and Twitter in an Academic Writing Course: A Case of Pre-Service EFL Teachers in Ecuador

Paola CABRER

Universidad Técnica Particular de Loja

Department of Education

EFL Learning, Teaching and Technology Research Group

11-01-608 Loja, Ecuador

pacabrera@utpl.edu.ec

Luz CASTILLO

Universidad Técnica Particular de Loja

Department of Education

EFL Learning, Teaching and Technology Research Group

11-01-608 Loja, Ecuador

lmcastillox@utpl.edu.ec

ABSTRACT

This study aimed to use the flipped classroom methodology supported by the technological tools Socrative, Padlet and Twitter in an Academic Writing course of the English Major in Universidad Tecnica Particular de Loja, Ecuador. The purpose of this research was to determine the effectiveness of flipped classroom to strengthen English academic writing skills and to identify students' perceptions regarding the use of technological tools as a means to guarantee competence achievement in this course. For this study, a group of 15 university students and 2 teachers participated. The course was taught during a period of five months on a weekly basis. Qualitative and quantitative approaches were used; thus, diagnostic and exit surveys were applied to determine the effectiveness of the study. The intervention period involved the use of the aforementioned technological tools for the presentation of paragraphs, writing strategies, and essays in academic English. The results showed that due to the application of the flipped classroom approach, students' participation improved because they became more actively engaged in the process of reading, understanding key contents, and designing materials before each lesson. In addition, significant progress was achieved in students' academic writing skills, particularly in aspects such as organizational structure of the text, correct usage of language, punctuation, coherence and cohesion.

Key words: academic writing, flipped classroom, Padlet, Socrative, Twitter.

INTRODUCTION

The new Information and Communication Technologies (ICTs) have an enormous potential in the educational field since nowadays there is a diversity of resources and tools which can be effectively used to innovate the way we teach. Indeed, the use of technology in education is an important process that demands both teachers and students to be always updated (Zainuddin and Halili, 2016). Certainly, teachers should include innovative technologies and resources to teach language skills (Çelik et al, 2012) because they can help students become more enthusiastic about learning EFL skills in the information age (Uluc, 2012).

In the context of language skills, writing is perceived as a fundamental skill that helps EFL students to acquire an appropriate level of linguistic competence (Cabrera, et al 2014). Regarding academic writing, it is considered as an indispensable skill all students need to learn; however, it is usually recognized as a challenging activity. In the same way, Alameddine and Mirza (2016) assert that writing is one of the most difficult activities because it is related to grammar and semantic instruction. In addition, Hyland (2015) emphasizes that nowadays academic writing is extremely important at a university level because it is at the heart of all disciplines. Indeed, it is fundamental for language learners because it is a multidisciplinary activity that involves an efficient use of strategies during students' study process (Munoz-Luna, 2015).

Academic writing can be taught using different approaches; thus, the flipped classroom is an important change in education, which is mainly focused on a variety of learning activities that can take place beyond traditional methodologies (Hachmann and Holmboe, 2014). According to Halili, Razak and Zainuddin (2014), this method is the opposite of traditional learning since it enhances collaboration in the classroom in a way that students construct their own knowledge through effective interaction with limited guidance from the teacher. In the same context, the flipped classroom benefits students because they have the opportunity to devote their time to develop pertinent activities before, during and after the class, according to their needs and levels of comprehension. This advantage is extremely important in terms of competence achievement because learners who are part of this model can become more active and interactive instead of being passive (Kim et al, 2014).

In order to achieve the aforementioned academic writing training through the flipped classroom model, technological tools such as Socrative, Padlet and Twitter constitute fundamental resources that have great benefits in the classroom. For instance, Socrative is a free system that allows teachers to catch students' attention through different entertaining activities such as games, quizzes, exit tickets, etc, which can be displayed in smartphones, laptops, and tablets (Keengwe, 2014). An important advantage of this tool is that it is used by teachers to design a variety of activities and control quizzes effectively. In addition, students' responses can be viewed online as a Google spreadsheet, as an excel file, and as graphs (Awedh, et al 2014; Keengwe, 2014). Regarding Padlet, it is a social media tool in the form of an online wall onto which students share comments, images, hyperlinks and other elements that motivate students' learning and contribution (Ellis, 2015). With respect to Twitter, it is a microblogging social network website which enhances collaboration in an asynchronous way. It also facilitates a peer-modeling and a peer-monitoring process in the classroom (Cheng, 2012).

Previous studies

Some studies have been conducted about the flipped classroom for enhancing students' writing skills; however, just a few of them have implemented innovative technological tools including Socrative, Twitter and Padlet in the teaching - learning process. In this context, Ahmed (2016) studied the impact of a flipping classroom approach on 60 EFL university students who were learning writing. The participants were classified into two groups: 30 students for the experimental group and 30 students for the control group, they were administered writing tests as well as questionnaires to determine their attitude towards flipping. Findings reveal that the experimental group got better results than the control group in the writing post-test due to the use of flipping.

Kassens-Noor (2012) studied the use of Twitter as an active, informal, outside-of-class learning tool through an experimental method. The main purpose of this study was to determine if Twitter helped students in learning a particular subject matter and if it offered more advantages than the ones offered by traditional teaching approaches. The results indicate that the use of this social network has potential opportunities in higher education.

Yoon (2017) examined students' perspectives on Socrative in 4 EFL classes. The participants were 114 college students in a Korean university who were administered two questionnaires at the beginning and at the end of the study. Results revealed that even though students were not motivated enough at the beginning of this learning experience, after an intervention period their perspectives on Socrative were positive across the board. In addition, they found the use of this tool to be positive because it catches students' attention and promotes classroom interaction. Also, participants preferred to use Socrative to check comprehension and to submit responses for speaking activities.

Weller (2013) explored the use of Web 2.0 applications, including Padlet, in pre-service teachers' professional learning. A class of secondary school student science teachers in England participated. Two tasks were given to complete using a collaborative online application. Their work was evaluated, as well as their comments about the use of technology. Current trends and practices surrounding the use of Web 2.0 technology and mobile/tablet devices for learning and teaching were also discussed. The results confirm the benefits of exposing pre-service teachers to Web 2.0 technology because they are able to see its uses and advantages in a classroom setting.

Even though there are many studies that analyze the use of Socrative, Twitter or Padlet from different educational perspectives, none of them were focused on integrating these three tools to teach EFL academic writing through the flipped classroom approach in the Ecuadorian context.

Research questions of the current study

This study is based on an innovation project conducted at Universidad Tecnica Particular de Loja (UTPL), located in Ecuador. The project included different flipped classroom stages aimed at enhancing students' academic writing through the use of Socrative, Twitter and Padlet for the presentation of paragraphs, writing strategies, and essay composition in academic English. The research questions to be addressed in this study are the following:

- Is the flipped classroom effective to strengthen English academic writing skills in pre-service EFL teachers?
- How do teachers and students perceive the implementation of the flipped classroom methodology through the use of technological tools?

METHODOLOGY

Setting and participants

The present study was conducted in Universidad Tecnica Particular de Loja, a private university in the southern region of Ecuador. The participants were 15 pre-service teachers (2 male and 13 female) who are studying academic writing as a course in the curriculum established by the English major. In addition, 2 teachers participated in this innovative research.

The students received four hours of academic writing classes a week and were enrolled in the fifth level of the English program. These students have a B1 proficiency level of the Common European Framework of Reference for Languages (CEFR).

Instruments

- A pre-questionnaire that consisted of 10 close-ended questions was applied to students in order to identify their technological skills and perceptions regarding the use of flipped classroom for learning academic writing.
- A post-questionnaire was administered to determine students' perceptions on the use of the flipped classroom methodology through Socrative, Twitter and Padlet for teaching academic writing. This instrument consisted of a combination of 8 multiple choice and open-ended questions.
- A self - evaluation was applied to teachers in order to know their perceptions about the use of the flipped classroom through Socrative, Twitter and Padlet for teaching academic writing.

Procedure

In this study, a mixed-method approach was used; according to Cresswell (2014), the mixed-method approach integrates qualitative and quantitative methods to grant a more complete understanding of a research problem than using them separately. In this way, it was possible to determine the participants' perceptions about the use of the flipped classroom methodology supported by technological tools for teaching aspects of academic writing; these included organization of paragraphs, writing strategies, and essay composition in academic English.

Regarding the technological tools used in this research, Socrative was implemented to evaluate students' knowledge before, during and after the analysis of a specific topic, Padlet allowed us to share information through an interactive wall; thus, students worked collaboratively to create notes and share them. In addition, the social network Twitter was used to share links and tips related to academic writing.

In order to improve the reliability and validity of questionnaires, they were piloted with a similar group of students and amendments were made. After the pre-questionnaire was piloted, it was administered to all the students. At the end of the study, a post- questionnaire was applied, and a self-assessment was administered to teachers. After gathering the data from the questionnaires, Excel tables were used in the analysis of the results, which were compared and contrasted for drawing conclusions.

RESULTS AND DISCUSSION

According to the students' pre-questionnaire results, 86% mentioned that their teachers had never used the flipped classroom when teaching English. On the other hand, 14% of them affirmed that they had previously received instruction through this methodology for learning different language skills. Regarding students' knowledge of the technological tools Socrative, Padlet and Twitter, most of them (93%) recognized Twitter as a popular social network, while only 15% of students had heard about the use of Padlet. With respect to Socrative, nobody knew about this tool and its characteristics.

After the study was conducted, the results of the post-questionnaire demonstrated that 71% of the students perceived the "Flipped classroom" as a very good methodology for learning academic writing skills, while the remaining 29% rated it as an excellent teaching innovation. These results indicate that the aforementioned approach really contributed to strengthen English academic writing skills. In this context, Ahmed (2016) asserts that the flipped classroom instruction not only allows improvement in writing, but it also allows improvement regarding learners' overall attitudes and beliefs towards the writing skill. The figure below shows students' perceptions about essential aspects in which they got better academic results through the use of Socrative, Padlet and Twitter.

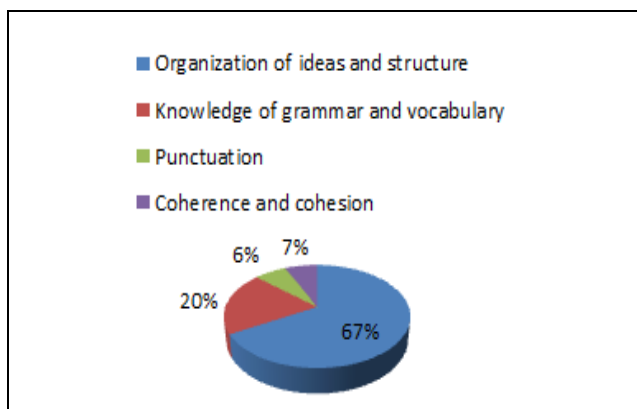


Figure 1. Student's perceptions about academic writing aspects that improved after using Socrative, Padlet and Twitter

In addition, the majority of students (86%) perceived that their writing skills improved in an excellent way and 14% rated them as very good. These results demonstrate that students' perceptions about their own progress in academic writing were significantly positive. According to Alameddine and Mirza (2016, p. 211), "writing strategies are essential for writers to refine their ideas in their academically written productions".

Seventy percent of the students perceived the social network Twitter as motivating, 15% preferred to use Padlet as a tool that facilitates collaborative work, 6% of participants were motivated by the use of Socrative, and the remaining percentage identified other types of tools as interesting. In this context, Kreutz and Rhodin (2016) claim that the use of technology is beneficial for learning because it is motivational for EFL students. Some significant benefits of using social networks when teaching ESL writing involve enhancement of outside classroom interaction, improvement of students' knowledge, greater motivation and confidence for using this language, improvement of learners' thinking and writing skills, among others (Yunus et al, 2012).

Regarding the students' perceptions about the use of the flipped classroom through technology, 57% of them stated that this innovative project increased their interest and motivation for learning academic writing skills in an excellent way. The remaining percentage (43%) perceived it as a very good way to increase their motivation to learn academic English.

In the same way, teachers were asked about their perceptions on the use of the flipped classroom in the context of this study. Thus, they agreed that this methodology, supported by Socrative, Padlet and Twitter, significantly contributed to enhance academic writing skills. Additionally, they claimed that in order for this methodology to succeed, permanent teacher's feedback is crucial before, during and after on-site sessions. In fact, feedback plays a fundamental role in writing development (Miaoa, Badger and Zhenc, 2006).

CONCLUSIONS

The "Flipped Classroom" methodology significantly contributes to the teaching of academic writing skills in English as a foreign language; it improves students' motivation and participation as they become more actively involved in the preparation of materials prior to on-site sessions, and it deepens the review of specific subjects so that students experience less uncertainty toward essay writing.

The characteristics offered by Padlet and Twitter allow students to work collaboratively and share information in order to improve academic writing skills in terms of organization of ideas and structure, knowledge of grammar and vocabulary, punctuation, coherence and cohesion.

Socrative is a very effective tool to evaluate specific academic writing aspects because students have the opportunity to demonstrate their knowledge in an enjoyable way by using individual or group quizzes; also, teachers can observe instant results and offer timely feedback.

ACKNOWLEDGEMENTS

The authors would like to take this opportunity to acknowledge Universidad Tecnica Particular de Loja authorities for promoting and supporting research projects through the EFL Learning, Teaching and Technology Research Group.

REFERENCES

- Ahmed, M. (2016). The effect of a flipping classroom on writing skill in English as a foreign language and students' attitude towards flipping. *US-China Foreign Language*, 14(2), 98-114.
- Alameddine, M., & Mirza, H. (2016). Teaching Academic Writing for Advanced Level Grade 10 English. *Procedia-Social and Behavioral Sciences*, 232, 209-216.
- Awedh, M., Mueen, A., Zafar, B., & Manzoor, U. (2014). Using Socrative and Smartphones for the support of collaborative learning. *International Journal on Integrating Technology in Education (IJITE)* Vol.3, No.4.
- Cabrera, P., González, P., Ochoa, C., Quiñonez, A., Castillo, L., Solano, L., ... & Arias M. (2014). Spanish Interference in EFL Writing Skills: A Case of Ecuadorian Senior High Schools. *English Language Teaching*, 7(7), 40-48.
- Çelik, S., Arkin, E., & Sabriler, D. (2012). EFL learners' use of ICT for self-regulated learning. *Journal of Language and Linguistic Studies*, 8(2), pp-98.
- Cheng, H. (2012). Applying Twitter to EFL reading and writing in a Taiwanese college setting (Doctoral dissertation, Indiana State University).
- Ellis, D. (2015). Using Padlet to Increase Student Engagement in Lectures. In *ECEL2015-14th European Conference on e-Learning: ECEL2015* (p. 195). Academic Conferences and publishing limited.
- Hachmann, R., & Holmboe, P. (2014). Flipped Learning Flipped Learning—mere end bare video, *Praxis*
- Halili, S., Abdul, R., Zainuddin, Z. (2014). Enhancing collaborative learning in flipped classroom: International Conference on Science, Engineering and Built Environment, 24-27 Nov 2014, Bali, Indonesia. (Submitted)
- Hyland, K. (2015). *Teaching and researching writing*. Routledge.
- Munoz-Luna, R. (2015). Main ingredients for success in L2 academic writing: Outlining, drafting and proofreading. *PloS one*, 10(6), e0128309.
- Keengwe, J. (2014). *Promoting active learning through the integration of mobile and ubiquitous technologies*. IGI Global.
- Kassens-Noor, E. (2012). Twitter as a teaching practice to enhance active and informal learning in higher education: The case of sustainable tweets. *Active Learning in Higher Education*, 13(1), 9-21.
- Kim, M., Kim, S., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: an exploration of design principles. *The Internet and Higher Education*, 22, 37-50.
- Kreutz, J., & Rhodin, N. (2016). The influence of ICT on learners' motivation towards learning English.
- Uluc, K. (2012). The positive effects of Integrating ICT in foreign language teaching. In *International Conference "ICT for language learning"*.
- Weller, A. (2013). The use of Web 2.0 technology for pre-service teacher learning in science education. *Research in Teacher education*, 3(2), 40-46.
- Yang, M., Badger, R., & Yu, Z. (2006). A comparative study of peer and teacher feedback in a Chinese EFL writing class. *Journal of second language writing*, 15(3), 179-200.

- Yoon, S. (2017). Using Learner Response Systems in EFL Classrooms: Students' Perspectives and Experience. *Multimedia-Assisted Language Learning*, 20(2), 36-58.
- Yunus, M., Salehi, H., & Chenzi, C. (2012). Integrating social networking tools into ESL writing classroom: Strengths and weaknesses. *English Language Teaching*, 5(8), 42.
- Zainuddin, Z., & Halili, S. (2016). Flipped classroom research and trends from different fields of study. *The International Review of Research in Open and Distributed Learning*, 17(3).

Formulating Learning Method in Higher Education for Global Readiness

Martani HUSEINI

Faculty of Administrative Sciences

Universitas Indonesia

martani0703@yahoo.com

Eko SAKAPURNAMA

Faculty of Administrative Sciences,

Universitas Indonesia

Eko.sakapurnama@ui.ac.id

Retno KUSUMASTUTI

Faculty of Administrative Sciences

Universitas Indonesia

rekusuma@yahoo.com

ABSTRACT

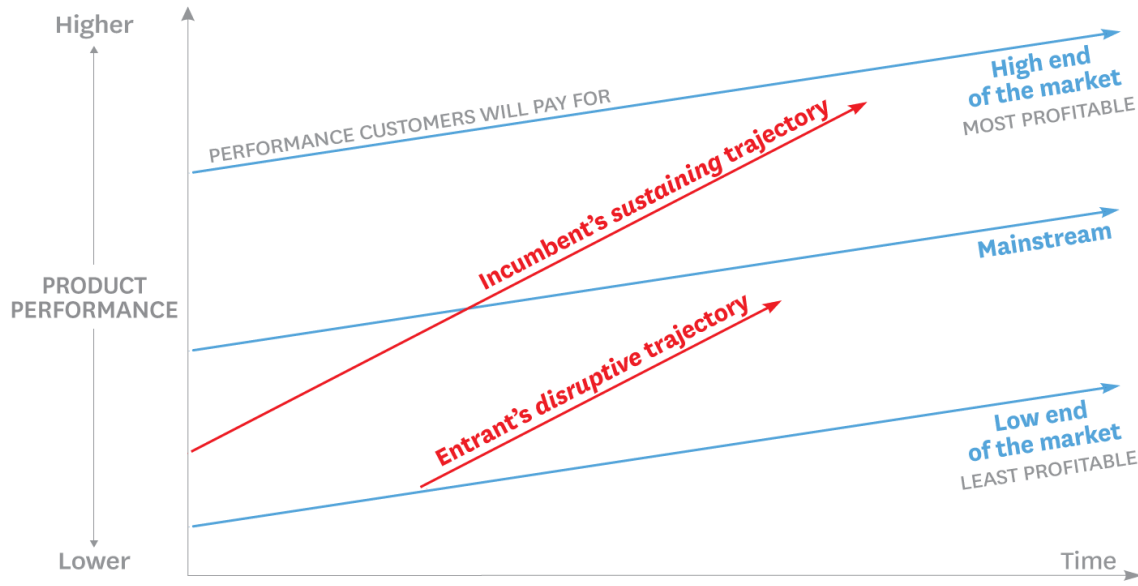
In the era of disruption, where the market emerged and most of organizations try to seek potential talent for future leader, human capital with global mindset is the most valuable asset that must be retained by an organization. Global readiness is the key attribute that must be owned by young generations., how they can have innovative mindset to sustain business organization. This study aims to analyze whether the learning method in higher education could create global readiness mindset. The approach of the methodology is analyzing quantitative data through survey with random sampling at 118 both undergraduate and graduate university students. Descriptive statistics is used to analyze the primary data. The result showed that student perceived global readiness learning method to be very important to be considered in formulating governance model facing the new era in developing a new method for teaching in higher education.

Keywords: Disruption, Learning Method, Global Readiness, Globalization, Higher Education, Innovation

INTRODUCTION

Nowadays, industrialization has shifted again to a ‘new direction’. Sometimes in an unpredictable direction. For example, ever since the time when internet was invented, there has been tremendous changing from analog products to digital products. Changes in the environment is very dynamic and the organization is required to be able to adjust for these changes. Capabilities of the organization should be improved as a step of adaptation in order to the sustainability of organization (Kusumastuti, et.al, 2016). We saw the giant camera-maker, Kodak, fail and go bankrupt due to its inability to innovate fast. While the demand of digital camera grew rapidly, and they could not meet the new customer demand (Hutabarat & Huseini, 2017). Then, after internet era, using “sharing economy” jargon, the disruptive era has become. Harvard Business School professor and disruption guru Clayton Christensen says that a disruption displaces an existing market, industry, or technology and produces something new and more efficient and worthwhile. It is at once destructive and creative (Christensen, 1995, Howard, 2013).

The phenomena of disruption is proved to be a powerful way of thinking about innovation-driven growth (Christensen, Raynor, Mc Donald, 2015). Christensen (1997) argues that how successful, outstanding companies can do everything to win the market and yet still lose their market leadership – or even fail – while a new start-up business as an unexpected competitor rises and takes over the market. There are two important parts to this dilemma. Firstly, value to innovation is an S-Curve: Improving a product takes time and many iterations which provide minimal value to the customer but in time the base is created and the value increases exponentially (see figure 1).



SOURCE CLAYTON M. CHRISTENSEN, MICHAEL RAYNOR, AND RORY MCDONALD
FROM "WHAT IS DISRUPTIVE INNOVATION?" DECEMBER 2015

© HBR.ORG

Figure 1. Disruptive Innovation

Source: Christensen, Raynor, Mc Donald, (2015)

Secondly, incumbent sized deals: The incumbent has the luxury of a huge customer set but high expectations of yearly sales. New entry next generation products find niches away from the incumbent customer set to build the new product. The new entry companies do not require the yearly sales of the incumbent thus have more time to focus and innovate on this smaller venture. We saw how online transportation platform, such as Go-Jek in Indonesia, disrupt Blue Bird Taxi; later they make collaboration to launch Go-Car in order to develop their business bigger.

This disruptive innovation happens not only in the manufacturing sector, but also in the higher education sector. In the last decade, the massive open online courses, or popular called MOOC.

This phenomenon must be realized by the CEO of all organizations. They must seek young talents to enhance their innovation, meet more people and think globally. Furthermore, the organization must understand the global culture itself. Multinational companies from individualist cultures such as USA, Europe, Australia, must understands their employees from collectivist culture such as Japan, China, or Indonesia and vice versa (Sakapurnama, 2013). Otherwise, the term "innovate or die" would happen and they cannot sustain their business.

Therefore, university as a higher education that creates potential talents has a challenge to develop their graduate with the global readiness mindset. Miller (2017) tried to define the global readiness itself, when students are global ready, they are able to meet specific competencies that allow them to be successful in the world around them. However, global readiness is more than simply being able to collaborate or communicate. Instead, these skills are connected to important nuances of cultures, perspectives and equity. It isn't just that students can collaborate with another person, but that they can partner and work within a global community and take action. Students develop empathy and global sensibilities, as well as connect with people of different cultures and communities across our world.

Other experts, try to define what global readiness is. Elings and Oliver (2010) from Delloite Consulting, use term global transformation readiness as the drivers for organization to optimize and standardize their business globally in five areas of transformation, as follows (1) Business model; identify where and how your company operates; (2) Governance model; undertand how company's decision-making framework; (3) Data and reporting; define the right level of data and information standardization; (4) Infrastructure; how company acknowledge and reduce complexity; and (5) Organizational capacity and capability; uncover gaps in areas of leadership, experience and knowledge.

Kerkhoff (2016) introduce teaching method for Global Readiness for K-12 Schools. There are four dimensions that link with the concepts. Firstly, Integrated – Including global issues and global learning concepts into the standard course of study within all classes K-12. Secondly, Situated – How the atmosphere of learning provide that each class is positioned in a particular time and place. Considering the context of each class by building relationships and making global education relevant and also utilizing real world content that is relevant to the students. Thirdly, critical – how the process of thinking about causes and effects of own actions and society's actions or lack of action. This will be encouraging students to question and analyze themselves, texts, and society. Furthermore, reflexivity as part of teacher practice and instruction for students. Lastly, Transactional – Providing opportunities for intercultural dialogue, not one-way action, but two-way giving and receiving, also facilitating experiences where students construct knowledge situation.

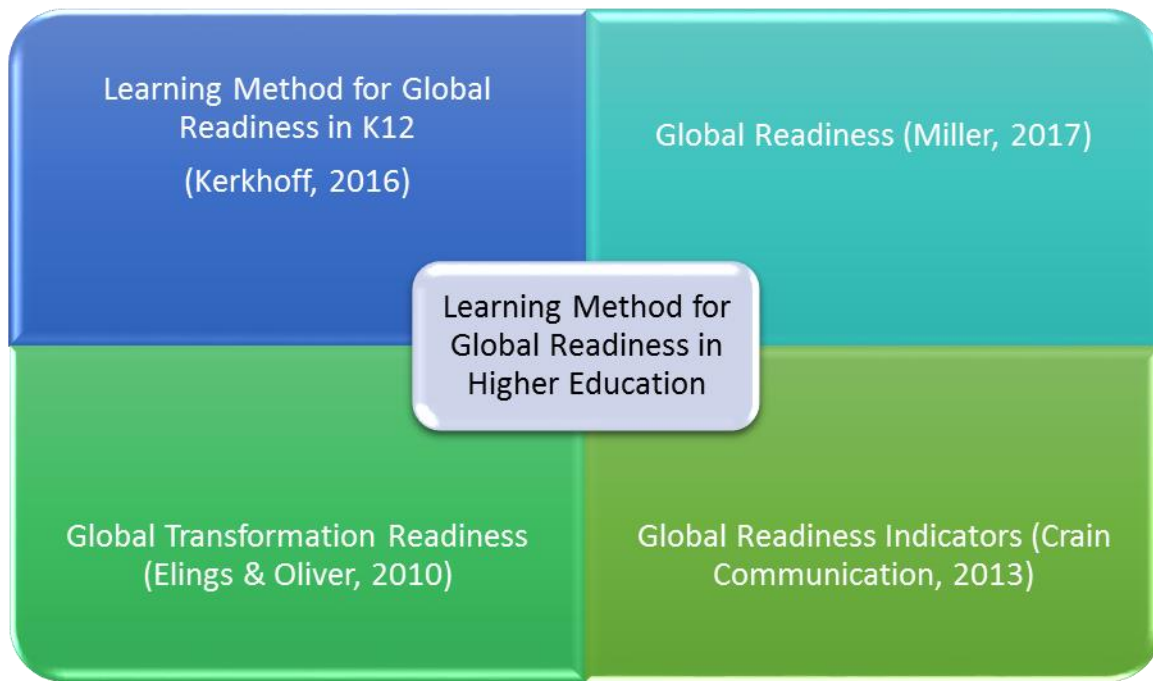
To enhance this exploration in formulating learning method for higher education, writers use other concept that more applied and practically suitable with the industry. According to Crain Communication (2013), one of leading HR Consultant worldwide, define the global readiness indicators within organizations. (see the table 1.)

Table 1. Global Readiness Indicators

No.	Dimensions	Indicators
1	Business Case	Have the program goals been identified and measures of s defined? Is this aligned to the company strategy? Who is responsible for delivery of the business case and gaining leadership buy-in? Is there a standard format within your organization for presenting a comparable global business case of this size?
2.	Change Management Initiatives	What is the level of experience of organizations with comparable complex of global implementations? What is the level of leadership? Does your company culture engage new initiatives on a voluntary or mandated participation? Is there a strategy to adress each global location?
3	Current State and Landscape	How well do you understand your current and projected global supply and demand of Talent Labour? How accurately can you report and forecast spend by category and geography?
4	Compliance and Governance	Have you identified the breadth of subject matter experts needed (etc. Legal , HR, Finance) How does your company ensure compliance to a new programme?

Source: Crain Communication (2013)

From those point of views, writers try to construct the operational definition of learning method for higher education in addressing globalization. The model of framework is shown in the picture below.



Picture

2. Model of Learning Method for Global Readiness in Higher Education

source: researcher (2017)

RESEARCH METHOD

This paper uses positivism approach that uses several theories to explore the learning method in higher education in preparing the student for global readiness. Survey has conducted through both online and offline to 118 students within Universitas Indonesia who are either in undergraduate or graduate programme. Accidental sampling is chosen as the sampling technique. This research uses SPSS 19.0 to analyze the result.

RESULT AND DISCUSSION

Based on the data collected from 118 students, 64,4 % of those students are undergraduate while 26,3 % are graduate, both in master and doctorate programme. And the rest that is accounted 8,5% of the total respondents did not answer the question.

Table 2. Respondents Profile

		Programmes			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no answers	10	8.5	8.5	8.5
	undergraduates	76	64.4	64.4	72.9
	graduates	31	26.3	26.3	99.2
	5	1	.8	.8	100.0
	Total	118	100.0	100.0	

Source: data analyses by SPSS 19.0 (2017)

Another profile of respondents is categorized by sex. 50 students are male or 42,4% of total respondents. And 56 are female or 47,5%. And the rest 12 students or 10,2% of respondents did not give answer.

Table 2. Respondents Profile by Sex

		Sex			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no answer	12	10.2	10.2	10.2
	Male	50	42.4	42.4	52.5
	Female	56	47.5	47.5	100.0
	Total	118	100.0	100.0	

Source: data analyses by SPSS 19.0 (2017)

From the data collected, majority respondents give opinion in the positive modes. Based on analyses by SPSS Program, most students perceive that learning method in the higher education that prepare student to compete globally agree with the indicators. The most important learning method viewed by the respondents are “Discussions in the context of global issues” and “Discussion of case study in the era of globalization help my understanding the information of the lecture”. Both statements have the highest average on 4,52 from scale of 5. (see Table.3). Thus, most students in university or college require case study as a tool of gaining knowledge in the global context.

On the other hand, the sample of this research has neutral response when judging the statement “Guest lectures from in-bound lecturer cannot build intercultural dialogue”. The mean average of the statement score 2,57 from scale of 5 which has interpretation of neutral (see Table.3).

Table.3 Average of Learning Method Indicators

No	Description	Mean	Interpretation
1	In my opinion, the method of learning by discussing the context of global issues in lecture sessions is important.	4,52	Strongly Agree
2	Discussion of case study that occurred in the era of globalization helped my understanding the information of the lecture	4,52	Strongly Agree
3	The lecture assignments in group form are more effective than individual tasks	3,49	Somewhat Agree
4	The task of lectures in a group can open a wider horizon of information	3,95	Agree
5	Group assignment may exercise teamwork	4,26	Agree
6	I think the task of group lectures can build a more tolerant individual character in accepting opinions	4,08	Agree
7	When students must present their assignments, I believe that these activities can train communication skills in public space.	4,47	Agree
8	Video lecturer in lectures can trigger students to think critically	4,01	Agree
9	I believe the lectures by professional can provide insight from theories in the real-world context	4,36	Agree
10	Company visit may facilitate application of theory into the real situation	4,49	Agree
11	Guest lectures from in-bound lecturer can not build intercultural dialogue*	2,57	Neutral

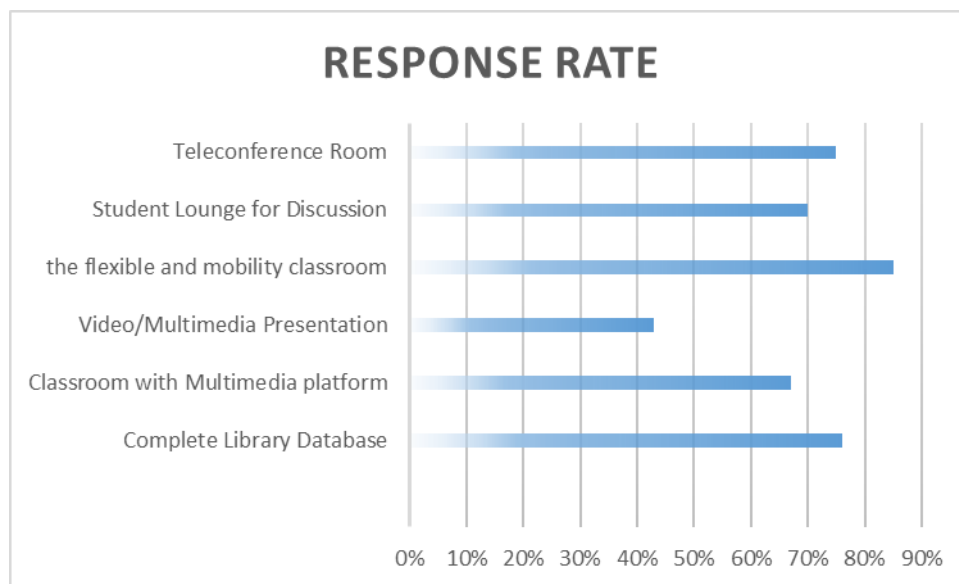
12	Overseas study visit becomes an alternative to enrich global insight	4,30	Agree
13	Evaluation of learning outcomes with classroom test methods is less relevant	3,46	Somewhat Agree
14	Lecture assignment by creating books may endorse creative thinking	3,68	Agree

Source: data analyses by SPSS 19.0 (2017)

*negative statement

Another result that reveals from this research is about the facilities required to endorse the learning method for global readiness and make the learning atmosphere conducive.

Most students choose the classroom flexibility and mobility as top requirement that accounted 85%, followed by complete library database in 76% response rate. The least response rate in this field is about the students being asked to make video or multimedia presentation, only 43% of students perceive that this assignment can make a contribution for the global readiness mindset (see picture.3).



Picture 3. Infrastructures for Global Readiness in Higher Education

Source: data analyses by SPSS 19.0 (2017)

Meanwhile, other infrastructures such as teleconference room has 75% response rate by the respondents. For the details see table.4.

Table.4 Infrastructure for Global Readiness in Higher Education

Facilities	Response Rate
Complete Library Database	76%
Classroom with Multimedia platform	67%
Video/Multimedia Presentation	43%
the flexible and mobility classroom	85%
Student Lounge for Discussion	70%
Teleconference Room	75%

Source: data analyses by SPSS 19.0 (2017)

CONCLUSION

As a result, this research shows that the learning method for global readiness viewed by students strongly agree with having discussion especially about a case study from an industry in the global context, that deliver information regarding the current trends. Most students also perceived that the classroom with high mobility and flexibility will be the catalyst in the learning method for facilitating global readiness mindset.

REFERENCES

- Christensen, Clayton (January 1995). "Disruptive Technologies Catching the Wave". *Harvard Business Review*: P 3
- Christensen, Clayton M., Raynor, Michael E. , McDonald, Rory, 2015. What Is Disruptive Innovation?, December 2015 Issue , (retrive) <https://hbr.org/2015/12/what-is-disruptive-innovation>
- Christensen, Clayton M, 1997. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Harvard Business School Press
- Elings, Peter., Oliver Doug. (2010), *Global Transformation Readiness, Is Your Organization Really Prepared*, posted in CIOinsight.com September 24, 2010
- Hutabarat, Jemsly, Huseini Martani, (2017), *Strategi, Pendekatan Terpadu, Komprehensif dan Simultan 'Strategik dan Operational' Secara Gemilang*, Prasetya Mulya Publishing
- Kerkhoff, Vessa, Shea Nicole (2016), Designing Global Futures: A Mixed Methods Study to Develop and Validate the Teaching for Global Readiness Scale, <https://repository.lib.ncsu.edu/handle/1840.16/11104>
- Kusumastuti, R., Safitri, N., Firdaus, N., Setyowati, M. S., Sakapurnama, E., & Nurita, P. (2016). Ambidexterity learning process for exploration and exploitation: A model of hybrid ambidextrous university. *Turkish Online Journal of Educational Technology*, 2016 (November Special Issue), 232-237. Retrieved from www.scopus.com
- Miller, Andrew (2017), *Designing Student Projects for Global Readiness*, <http://www.gettingsmart.com/2017/01/designing-student-projects-for-global-readiness/>
- Sakapurnama, E (2014), Cross-cultural communication in multinational companies: Problems and suggestions, *Recent Trends in Social and Behavioral Sciences- Proceedings of the 2nd International Congress on Interdisciplinary Behavior and Social Sciences 2013, ICIBSoS 2013* pp. 71-75

Fostering Students' Creativity by Designing Their Own Periodic Table

Karntarat WUTTISELA

*Department of Chemistry and Research and Innovation in
Science Education Center (RISE Center)
Faculty of Science,
UbonRatchathani University
Thailand
Karntarat.w@ubu.ac.th*

ABSTRACT

Creativity is one of the expected top three skills in 2020 and the one of 7C skills for the twenty-first century. This research aimed to enhance creativity in 112 first year pharmacy students at Ubon Ratchathani University. The students were divided to 28 groups to complete an assigned task to design their own periodic table which was never seen by internet searching. A periodic table in the form of a tree was given to the students as an example. Results showed that the most popular designs were *Chaliew* (a symbol of Thai traditional medicine), fish, robots, and cars (39%, 27%, 22%, and 22% respectively)

INTRODUCTION

It is anticipated that the top 10 skills in 2020 will be complex problem saving, critical thinking, creativity, people management, co-ordination with others, emotional intelligence, judgment and decision-making, service orientation, negotiation, and cognitive flexibility (Luu, 2017). Creativity is the demonstration of original thinking and is composed of fluency, flexibility, originality, and elaboration (Torrance, 1969). It is regarded as one of the top three of expected skills and one of 7C skills for 21 century: critical thinking and problem solving, creativity and innovation, cross-cultural understanding, collaboration, teamwork and leadership, communications, information, and media literacy, computing and ICT literacy, career and learning skills. Those who have high creativity skill will be able to solve problems better than those who have low creativity (Rainwater, 1965).

Scientists give high priority to creativity. Einstein said, “Creativity is intelligence having fun”; “Education is not the learning of facts, but the training of the mind to think”; “Creativity Is contagious. Pass it on”; and “Imagination (or creativity) is more important than knowledge” (Pinterest, 2017). Scientists’ inventions are based on their creativity. If they lack this skill, there is no knowledge induced according to the scientific process. Creativity originates from the need and the preparation, not the specific skill or gift but the effort. It is the intrinsic motivation (Marzano, 1988: 141).

Guilford (1967) stated that scientific creativity is the ability of the learner to use scientific theory to widen their ideas, shape their thoughts, and season their brains to produce new valuable ideas. It consists of three types, fluency, flexibility, and originality. Fluency is students’ ability to react to problems or situations as much as possible in limited time. Flexibility is students’ ability to arrange their ideas into categories. Originality is students’ ability to approach problems and situations from different perspectives to those of the majority of people. Much research indicated that science learning management aims to encourage students’ creativity by allowing research to be completed in the same ways as those of other scientists.

Scientific creativity also benefits other learning skills. For example, opportunities are provided for students to be active and complete their own experiments, allowing them to gain more confidence and courage to speak with their own voice, even if it is different from others. Moreover, it promotes teamwork skills and democratic learning as they listen to others' opinions. Students become able to think analytically to identify problems and solutions from different perspectives. They develop their thoughts, widen their ideas, and think more profoundly. At the same time, they reflect on these thoughts and ideas, examine the rationale of their work, identify their strengths and weaknesses, and consider their improvement. Their learning achievement increases and attitudes to science learning become more positive as learning activity promotes their creativity and challenges their skills. Students develop the ability to apply their knowledge in their regular lives (Hu, 2013; Daud, 2012; Stojanova, 2010; Vivian, 2004), and to become creative problem-solving persons (DeHaan, 2009).

OBJECTIVES

The research aimed to develop the originality of first year university students and identify the most popular by peer assessment.

METHODOLOGY

The participants were 112 first year pharmacy students at Ubon Ratchathani University. They were divided into 28 groups to complete an assigned task to design their own periodic table without consulting the internet. Students were required to give the reason behind their designs. A tree periodic table was given to students as an example (Fig. 1).

Figure 1. Example of the design of a periodic table

The teaching process to motivate creativity consists of five stages. These are: 1) Fact-finding from nervousness and confusion but still unable to identify the problem; 2) Problem-finding – student is able understand and identify the cause of the problem; 3) Idea-finding – student is able to think and to set a hypothesis, including data collection to test their ideas; 4) Solution-finding – student is able to test the findings of the hypothesis and to produce answers; and 5) Acceptance-finding – student is able to accept the answer (Torrance, 1969).

Evaluation

1. The teacher examined the periodic tables designed by the students to check if their designs were copied by searching on the internet by entering 'periodic table.' and shape for example periodic table fish.
2. Students recorded a vote score for their peers' periodic tables.

FINDINGS AND DISCUSSIONS

These results showed that the most popular design was *Chaliew* (Fig. 2a), fish (Fig. 2b), robot (Fig. 2c), and car (Fig. 2d) (39%, 27%, 22%, and 22%). *Chaliew* was the most popular because it was a symbol of Thai traditional medicine.

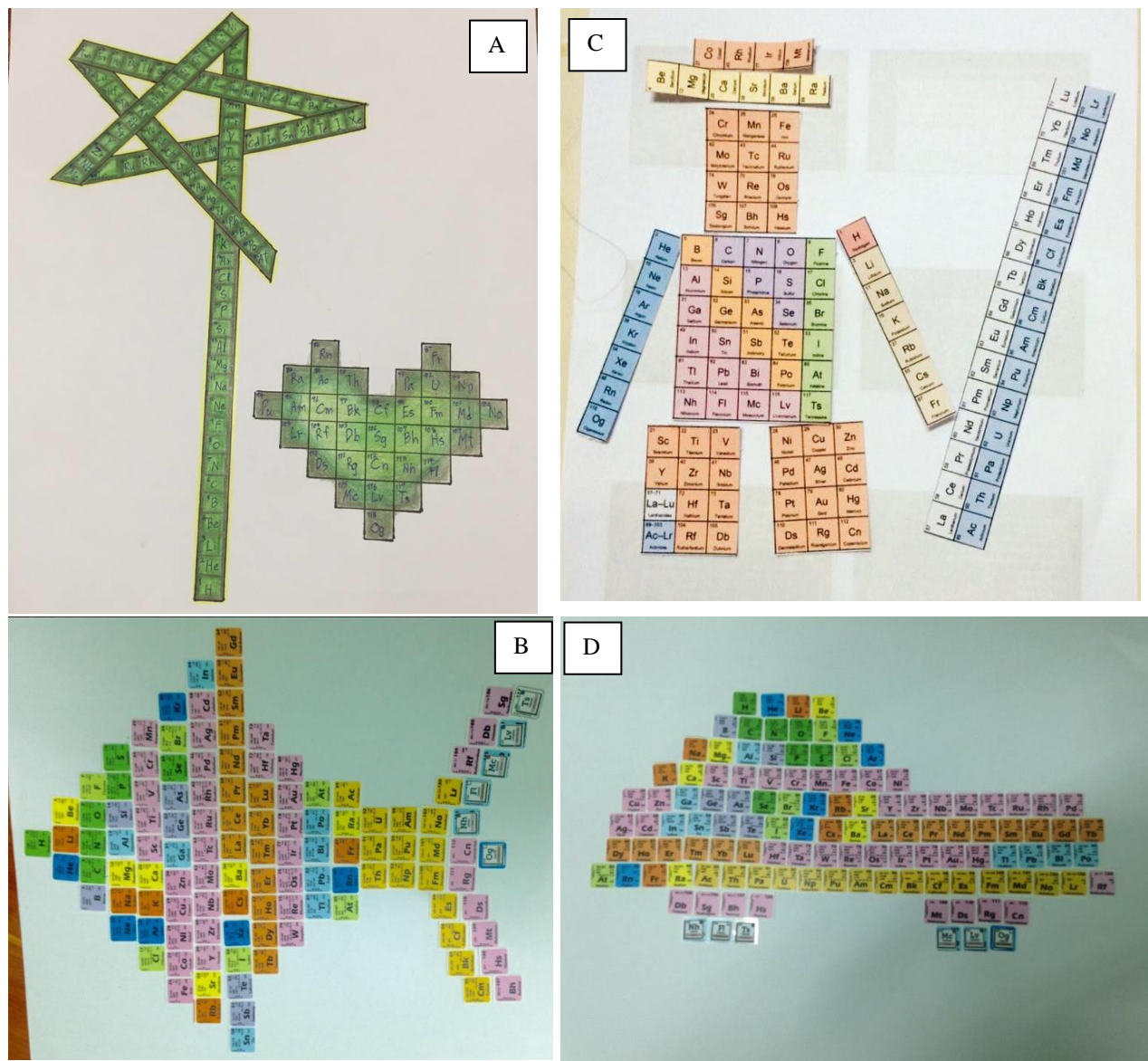


Figure 2. Designs of periodic table by students: (a) Cha-liew, (b) fish, (c) robot, and (d) car.

Fig.2, it is evident that students in every group rated the satisfaction level on the periodic tables designed by the students, ordering from the atom number. Fig 2A, Cha-liew design is composed of a star shape and a heart shape, the symbol of the Faculty of Pharmaceutical Sciences. The reason for this design is shown in Fig 3 and aims to represent unity and harmony of pharmacy students. However, the other students tried to motivate friends to vote their group as well. One observation found is Cha-liew was written by hands while the other students printed the pictures to build the periodic table. It is apparent that apart from Cha-liew group that represents their outstanding originality, they are able to remember the information because they wrote it by themselves. This benefits their memory skill creatively.

Therefore, the teacher should add one more condition for students to design the periodic table by hand to increase their memory skills. In accordance with Thorndike theory, Law of Exercise states that learner practice or repetition leads to accuracy (Thorndike, 1966)

We are proud to present a periodic table that represent about our field of study, Pharmacy. We designed something resemble the star called "Cha-liew", which is used to protect liquid drug in bolling pot. In the past, A pharmacist will put this Cha-liew on top of the pot to keep high efficiency of the drug. Moreover, The heart logo means unity and harmony of pharmacy student. We are appriciated to my occupation. According to the provide picture ,colour of periodic table is olive green. This shade is symbol of phamacist. #Team15

Figure 3. Capture screen of the reasons why the students designed the periodic table in Cha-liew shape

Some student groups designed the periodic tables in a heart shape (Fig. 4a). According to Levine (1990), the heart is the popular shape internationally. However, students in this research has the different idea to design the periodic table for the electron configuration and adding the recent discovered symbols which are Nh, Mc, Ts, and Og (Fig 2a-d and Fig 4a-b). Levine (1990) also some designs of romantic periodic tables and periodic city. For the periodic Valentine, there is no elements configuration but they use the word, Valentine to connect the elements in the table such as V defines to Vanadium and Al defines to Aluminum.

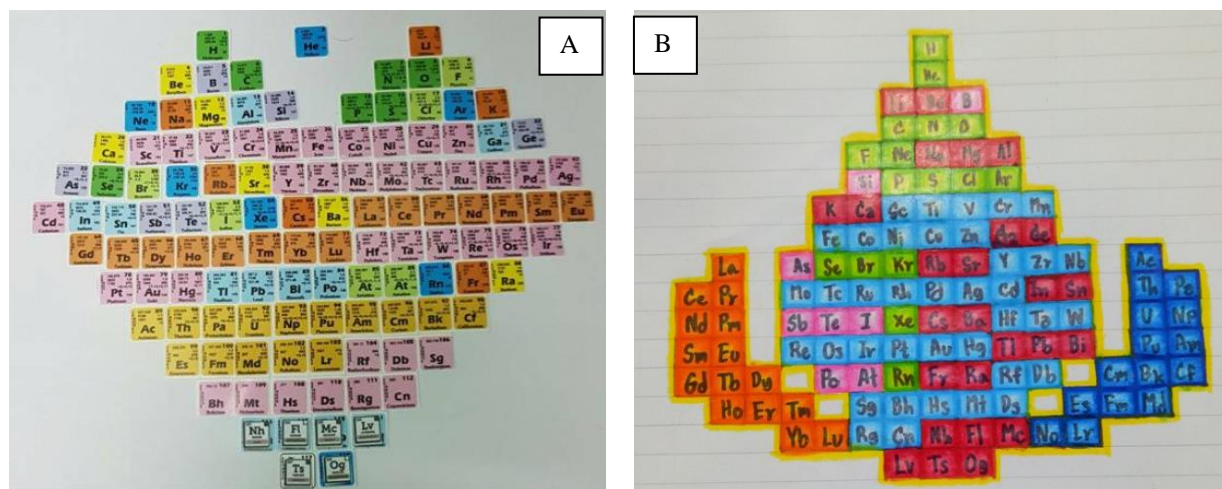


Figure 4. Designs of periodic tables by students – (a) heart; (b) lotus

Some student groups designed and named the periodic tables as "Lotus periodic table" because they got inspiration from the Ubon Ratchathani University" logo. These elements of the periodic table were sorted by atomic mass. In these, red represents metal, green represents non-metal, pink represents metalloids, light blue represents transition, transition that atomic mass 57-71 on the left (orange) and atomic mass 89-103 on the right (blue) (Fig. 4b). This indicated that creativity originates from the effort of students not the specific skill or gift (Marzano. 1988).

CONCLUSION

The teacher assigned the task to promote students' creativity. The students designed periodic tables in their group and every group was able to design creatively. The students were satisfied with the design, Cha-liew was the most popular because it is the symbol of pharmacists.

ACKNOWLEDGEMENTS

The authors thank the staff of the Office of International Relations at Ubon Ratchathani University for assistance with English.

REFERENCES

- Daud, A. M., Omar, J., Turiman, P., and Osman, K. (2012). Creativity in Science Education, *Procedia - Social and Behavioral Sciences*, 59, 467-474.
- DeHaan, R. L. (2009). Teaching creativity and inventive problem solving in science. *CBE-Life Sciences Education*, 8(3), 172-181.
- Guilford, J.P. (1967). *The Nature of Human Intelligence*, New York: McGraw-Hill.
- Hu, W., Wu, B., Jia, X., Yi, X., Duan, C., Meyer, W., and Kaufman, J. C. (2013). Increasing Students' Scientific Creativity: The "Learn to Think" Intervention Program. *Journal of Creative Behavior*, 47(1), 3-21.
- Levine, E.H. (1990). Create your own periodic table. *Journal of Chemical Education*, 67(12), 1045.
- Luu, V. (2017). The 10 Skills You'll Need By 2020 (And Beyond). Available: <https://www.careerfaqs.com.au/news/news-and-views/the-10-skills-you-ll-need-by-2020-and-beyond>.
- Marzano, R. J. (1988). Dimensions of thinking: A framework for curriculum and instruction. The Association for Supervision and Curriculum Development, 125 N. West St., Alexandria, VA 22314-2798.
- Pinterest. (2017). Best 20+ Albert einstein poster ideas on Pinterest. Available: <https://www.pinterest.com/explore/albert-einstein-poster/?lp=true>.
- Rainwater, J. M. (1965). Effects of set on problem solving in subjects of varying levels of assessed creativity (Doctoral dissertation).
- Stojanova, B. (2010). Development of Creativity as a Basic Task of the Modern Educational System, *Procedia - Social and Behavioral Sciences*, 2(2), 33953400.
- Thorndike, E.L. (1966). *Human learning*. Cambridge, Mass: M.I.T. Press.
- Torrance, E.P. (1969). *Guiding Creative Talent*. Englewood Cliffs, Prentice Hill, Inc.
- Vivian M. C. (2004). Developing Physics Learning Activities for Fostering Student Creativity in Hong Kong Context, *Asia-Pacific Forum on Science Learning and Teaching*, 5(2), 1-33.

Gender Difference in the Use of Learning Strategies: A Pakistani Perspective

Dr. Shahida SOHAIL

Associate Professor of Education

Govt. College for Women, Gulberg, Lahore, Pakistan

s.sohail06@gmail.com

ABSTRACT

This descriptive research study is an effort to investigate gender difference in using learning strategies among Pakistani undergraduates. LASSI (Weinstein, Palmer, & Shulte, 2002) was administered to sample of 4836 students: 2623 female and 2213 male students from 18 universities. 10 of them were public sector universities and 8 were private sector universities. Sample was selected through stratified cluster sampling. The LASSI was consisted of 80 statements on 5-point scale. There were ten subscales anxiety attitude, concentration, selecting main ideas, time management, motivation, test strategies, information processing, study aids and self testing. Cronbach alpha range was 0.73 to 0.89. Data were analyzed by using SPSS version 15. One way MANOVA was applied for data analysis. Cohen's decision rule was used for effect sizes. Results exhibited that female respondents were significantly better on three scales: selecting main idea, test strategies and attitude while male respondents did not score better on any of the subscale.

Keywords: Gender, LASSI.

INTRODUCTION

Undergraduates enjoy different strategies to enhance their learning during studies. According to Entwistle, McCune, and Hounsell (2002) learning strategies are amongst those variables which influence the eminence of undergraduate students' learning. Mayer (1988) posits that these strategies include "behaviors of a learner that are intended to influence how the learner processes information" (p.11).

Hartman (2002) identified procedural, conditional and declarative as kinds of knowledge which efficient strategy users acquire. Knowing about a variety of strategies is called declarative knowledge, procedural knowledge is about how these strategies be used and the decision about when these strategies be used is the paradigm of conditional knowledge (Carrel, Gajdusek & Wise, 2002).

By and large, female and male respondents demonstrate dissimilar learning behaviors (Sohail, Shahzad & Iqbal, 2012). A mounting body of research investigated the impact of gender on strategy use and most of them reported better female respondents' strategy use than their male respondents (Sohail, 2013). Hyde (2005) advocates that females and males were alike on some mental variables. He also augmented regarding gender age and perspectives do matter. Nambiar (2009) viewed gender as a non predictable reflector of strategy use. Downing (2009) on the other hand reported females' significantly better use of self-regulation strategies and a more encouraging attitude towards academics than their males.

A study calculated correlation among academic success and anxiety and found that mature female respondents showed more motivation than their counterparts (Sizoo, Malhotra & Bearson, 2003). Gender typically relies on biological underpinnings. Two decisive features, different social images and natural distinctions are invoked in it (Downing, 2009). The study in hands considers gender as to discriminate female and female respondents. Their sex, their social and psychological character are the focal determinants.

Sohail, Shahzad & Iqbal (2012) used LASSI on 465 Pakistani students of a university and found that female students outperformed on nine sub-scales but the difference was significant only on three sub-scales which were CON, ATT and TMT. As far as male students were concerned, they were slightly better than their counterparts on

STA.

The current study is the continuation of previous study conducted by Sohail et al., (2012), which was conducted with the sample of 465 students of only one public sector university. In the current study, gender differences are taken into account on a large sample from many public and private sector universities of Pakistan.

METHOD

18 universities of the Punjab were selected through random sampling on first stage, 10 of them were public sector universities and 8 were private sector universities. At second stage 4836 students were selected conveniently from all universities. 2623 were female and 2213 were male students.

LASSI (Weinstein, Palmer & Shulte, 2002) consisted of 80 items on five-point scale on three components: will skill and self-regulation. There were ten scales: test strategies, attitude, time management, anxiety, selecting main ideas, motivation, concentration, self testing, information processing, and study aids, Cronbach alpha range was 0.73- 0.89. Respondents' opinions were added to get total score. 40 was the maximum whereas 8 were the minimum score. Means were calculated for both groups. SPSS version 15 was used to analyze data. One way MANOVA was applied. Cohen's decision rule was used for effect sizes for the sack of precision.

FINDINGS

MANOVA facilitated to calculate the outcome of gender as IV on 10 LASSI subscales as DV. After that further Analysis was applied on every DV i.e. LASSI scales. The descriptive statistics are given in Table 1.

Table 1
Descriptive

DV	Male			Female		
	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
ANX	24.60	5.98	2213	24.75	5.92	2623
ATT	25.44	5.73	2213	26.77	5.36	2623
CON	25.11	5.40	2213	26.03	5.24	2623
INP	26.23	5.76	2213	26.32	5.96	2623
MOT	26.67	6.16	2213	27.24	6.40	2623
SFT	25.55	5.37	2213	25.13	5.79	2623
SMI	25.91	5.59	2213	27.09	5.47	2623
STA	25.92	5.61	2213	25.90	5.42	2623
TMT	24.14	5.13	2213	24.78	4.75	2623
TST	25.36	5.33	2213	26.75	5.48	2623

DV= Dependent Variables

The results of MANOVA and univariate ANOVA are given in Table 2.

Table 2.
MANOVA & Univariate ANOVA for Gender wise Comparisons

DV	MANOVA				ANOVA			
	<i>Wilks's criterion</i>	<i>F</i>	<i>df</i>	<i>p</i>	<i>F</i>	<i>df</i>	<i>p</i>	η_p^2
	0.968	15.80	10,4825	.000				
ANX					.77	1, 4834	.378	.000
ATT					69.72	1, 4834	.000	.014
CON					36.12	1, 4834	.000	.007
INP					.28	1, 4834	.592	.000
MOT					9.96	1, 4834	.002	.002
SFT					6.80	1, 4834	.009	.001
SMI					54.95	1, 4834	.000	.011
STA					.02	1, 4834	.892	.000
TMT					19.89	1, 4834	.000	.004
TST					79.02	1, 4834	.000	.016

ANOVA, $p < .005$ & MANOVA, $p < .05$ η_p^2 = ES

Table 2 reflects that difference is significant among females & males on DV, considering the results for DV one by one, significance difference was found on 3 of the LASSI scales. Further analysis reflected that on 3 scales female respondents' score was significantly better as compare to males.

Table 1 & 2 shows that on ATT, selecting main idea and on test strategies female respondents' score was significantly higher as compare to male respondents. The decisions were taken on the basis of effect sizes for the sake of precession. So the results of the study reveal that female respondents were more efficient in strategy use as compare to males because females scored significantly better on three of the scales: selecting main idea, attitude and test strategies. Male university students scored low on all the subscales.

CONCLUSIONS

The findings showed that the two groups are different for three of the scales. On attitude, test strategies, and selecting main idea subscales, females were better than males. Male students were not significantly better than females on any of the LASSI subscale. Findings reflect that females proved themselves more effective in their strategy use than males.

The results are not different than earlier studies of impact of gender on students' learning strategy use (Braten & Olaussen, 1998; Griffin, 2012; Sohail, 2013; Sizoo, 2003; Sohail, et al., 2012). The findings of this study follow the trend that females possess more traits of being strategic as compare to male students. Studies reveal that females are more responsible, careful, emotional and serious than males (Iqbal, et al., 2010). Griffin, et al., (2012) augmented a noteworthy finding that female students outperformed than males in their academics due to the mediating variable which is the use of learning strategies. Du, Weymouth and Dragseth (2003) also of the view that females seem to be more hard worker, engaged in school environment, and more responsible than boys.

On the basis of the results of the study certain courses, modules/ lectures on strategy use may be introduced at this level to manage this disparity. Male students need to be encouraged to promote productive and effective ways to make them better strategy employer. Findings of this study call for conducting more research to know the reasons of male students becoming less strategy users.

REFERENCES

- Braten, I. & Olaussen, B. S. (1998). The learning and study strategies of Norwegian first-year college students. *Learning and Individual Differences*, 10 (4), 309-327.
- Carrell, P. L., Gajdusek, L., & Wise, T. (2002). Metacognition and EFL/ESL reading. In H. J. Hartman (Ed), *Metacognition in learning and instruction: Theory, research and practice* (pp.229-244). London: Kluwer Academic Publishers.
- Downing, K. (2009). Gender and cognition. Proceedings of the 2nd International Conference of Teaching and learning (ICTL 2009). INTI University College, Malaysia. Retrieved January 05, 2010, from [http://ictl.intimal.edu.my/proceedings/Parallel%20Sessions%201/1A/1A-01-P24%20\(Hong%20Kong\).DOC](http://ictl.intimal.edu.my/proceedings/Parallel%20Sessions%201/1A/1A-01-P24%20(Hong%20Kong).DOC)
- Du, Y., Weymouth, C. M., & Dragseth, K. (2003). Gender difference and student learning. Paper presented at the annual meeting of the American Educational Research Association at Chicago, April, 21-25, 2003. Retrieved December 12, 2009, from http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/1b/23/a5.pdf
- Entwistle, N., McCune, V., & Hounsell, J. (2002) *Approaches to Studying and Perceptions of University Teaching Learning Environments: Concepts, Measures and Preliminary Findings*. Enhancing Teaching-Learning Environments in Undergraduate Courses Project. Retrieved January02, 2010, from <http://www.tlrp.org/dspace/retrieve/142/ETLreport1.pdf>
- Griffin, R., MacKewn, A., Moser, E., & VanVuren, K. W. (2012). Do learning and study skills affect academic performance? An empirical investigation. *Contemporary Issues In Education Research*, 5(2) , 109-116.
- Hartman, H. J. (2002). Developing students' metacognitive knowledge and skills. In H. J. Hartman (Ed), *Metacognition in learning and instruction: Theory, research and practice* (pp. 33-68). London: Kluwer Academic Publishers.
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, 60(6), 581-592. DOI: 10.1037/0003-066X.60.6.581.
- Iqbal, H. M., Sohail, S., & Shahzad, S. (2010). Use of learning and study strategies by Pakistani university students. *Procedia - Social and Behavioral Sciences*, 2(2), 4717-4721.
- Mayer, R. E. (1988). Learning strategies: An overview. In C. E. Weinstein, E. T. Goetz & P. A. Alexander (Eds.), *Learning and study strategies: Issues in assessment, instruction, and evaluation*. (pp. 11-24). San Diego: Academic Press.
- Nambiar, R. (2009). Learning strategy research- where are we now? *The Reading Matrix*, 9(2), 132-149.
- Sizoo, S., Malhotra, N., & Bearson, J. (2003). A gender-based comparison of the learning strategies of adult business students. *College Student Journal*. Retrieved January 05, 2010, from http://findarticles.com/p/articles/mi_m0FCR/is_1_37/ai_99816488/
- Sohail, S., Shahzad, S., & Iqbal, H. M. (2012). Use of learning and study strategies: Does gender make a difference? *Journal of Social Sciences*, 5 (1), p. 51-58
- Sohail, S. (2013). *Use of Learning and Study Strategies by Under Graduate Students*. An unpublished PhD thesis submitted to the Institute of Education & Research, University of the Punjab, Lahore, Pakistan.
- Weinstein, C.E., Palmer, D.R., & Shulte, A. C. (2002). *LASSI 2nd edition*. Clearwater, FL: H & H Publishing Company.

Global Transfer of 'the Ugly Indian' Project for the Values Formation

Fernanda TUSA

Center of Investigations

Technical University of Machala

Ecuador

ftusa@utmachala.edu.ec

Tomas FONTAINES-RUIZ

Center of Investigations

Technical University of Machala

Ecuador

Eduardo TUSA

Center of Investigations

Technical University of Machala

Ecuador

ABSTRACT

In the issue 'Global Issues in Education and Research', specifically within the sub-theme 'Cultural Diversity and Inclusive Learning' this article analyzes a case study called 'The Ugly Indian' a proposal of a group of volunteers who work together to clean the India streets in order to improve the self-esteem of the inhabitants and therefore their habitat of life. Besides, this group wants to eradicate the following stereotype: all Hindus are dirty, a stigma that has historically affected their identity, their culture and their social inclusion. The methodology applied is the virtual ethnography through a guided expedition by the 'The Ugly Indian' website by mean of the bibliographic review. As final consideration, this article establishes that amateur projects such as 'The Ugly Indian' can be transferable to any world context and their educational contribution is essential because it is based on the communication-action paradigm and linkage with the community, basic aspects for future professionals training of any discipline and field of study.

Keywords: Good practices, social responsibility, civic values, attitude change.

Indians do not have the same civic sense as, say, Scandinavians. The boundary of the space you keep clean is marked at the end of the space you call your own.

Suketu Mehta (2012)

1)Theoretical framework

In a 2016 report, Minister of State of Environment, Forest and Climate Change of India, Prakash Javadekar, had pointed out that 62 million tonnes of waste is generated annually in the country at present. About that, we can ask the following questions (Jadeja, 2014):

- How many times have you ignored a dirty street?
- How many times have you thrown a piece of garbage on the street?
- How many times have you walked the streets of an Indian city and shaken your head disapprovingly at the levels of filth and dirt surrounding you?
- How many times have you subtly flicked a piece of garbage onto the pavement public area?
- How many times have you told yourself that keeping public spaces clean is the responsibility of the local municipal corporation and not yours?

However, one does not need to look at the data to know just how littered out streets are. The question is what we can do? Can we blame the government or can we wield the broom in our hands to clean up the mess in our city? (Parekh, 2011). What do you call a group of anonymous citizens who come together in a city and clean up dirty streets by themselves? (Mohandas, 2015).

A group of volunteers accessorized with cleaning equipment takes to the streets to scrub their city clean. The gloves, shovels, paint come out and they are spent stripping lampposts of layers of posters, whitewashing over betel leaf stains at bus stops and cleaning the garbage dumped at local landfills (Chatterjee, 2014).

This group believes that together, they can make their city a cleaner place – and they set out to achieve just that. Footpaths with litter strewn on them, open dumpyards, etc. are literally washed clean with the help of citizens and municipality staff; at times, even passersbys join in to help (Chatterjee, 2014).

The result: clean streets with manicured lawns make way for what was previously a heap of filth. Hand-painted walls with pretty designs replace the foul stench of the past. People, both young and old, literally lend a hand in these clean-up drives.

The Ugly Indian (TUI) project is led by people who do not want their identities revealed. The volunteers themselves are largely anonymous as well, but still highly organized. They are working quietly to change the face of Bengaluru by motivating locals to restore eyesores, and they have touched a nerve with communities fed up with littering (Chatterjee, 2014).

Moreover, TUI is a group of anonymous citizens motivated by a desire to clean up our smutty city streets, who decided to take matters into their own hands. The Ugly Indian is transforming India, one city street at a time.

Since the theoretical vision of Stairs 2(012), the Ugly Indian describes itself such as:

This is an initiative, which showcases ways to keep neighborhoods clean and neat. It provokes citizens to take ownership of the problem and empowers them to solve it. Greater numbers of people coming forward and solving the problems in their own neighborhoods is what we consider as success. Being highly active on web 2.0, our message is reaching many across the world. It is already expanding on its own. Our work is a lab to present to the world ‘a proof of concept’. We would like to solve different visible problems and issues in public spaces, which ruin the look, feel and experience of public spaces.

There are interesting case studies put up where *The Ugly Indian* team has managed to completely transform certain shoddy and filthy public properties. One such case is that of a wall that was stained beyond recognition by chewers. The Ugly Indian team painted the wall strategically, urged people not to spit around the vicinity and put up pots with palm plants (Parekh, 2011).

As wonderful as it is to read the various changes they showcase, it is also very interesting to know the people who transformed this public place. The people involved are the garbage staff, the private housekeepers, the shopkeepers, and random passersby. By transforming streets, the Ugly Indian has showed us that such a thing is possible in our country. The *Ugly Indian* see hope, due to things can be changed. All it needs is our will and cooperation (Parekh, 2011).

In words of TUI (2010) members:

We view the problem of visible filth on our streets as a behaviour and attitude problem that can be solved in our lifetime. This can be achieved without spending money or changing legislation or systems. It requires coming up with smart ideas to change people's rooted cultural behaviour and attitudes. Moreover, making sure those ideas work.

No moralising, activism or self-righteous anger is part of the guidelines. Besides, anonymity is the hallmark of the movement. In this sense, if anyone breaks that code and speaks to the media, it would dilute the purpose. They do not talk to the media, or anyone. Nobody is authorized to speak to the media on behalf of TUI (Chatterjee, 2014).

The Ugly Indian's objective is to make the public spaces clean and neat, and to enhance the experience of public spaces. This group is more concerned about the look and feel of these spaces and the embarrassment they cause to all of us. They do not have much experience in solving issues regarding public hygiene and environment. India has elaborate and detailed laws, but their enforcement is poor (Stairs, 2012).

1.1. Project beginnings

The Ugly Indian (TUI) project is led by people who do not want their identities revealed. The volunteers themselves are largely anonymous as well, but still highly organized. They are working quietly to change the face of Indian streets by motivating locals to restore eyesores, and they have touched a nerve with communities fed up with littering (Chatterjee, 2014).

The Ugly Indian is an incredibly great initiative, targeted at invoking and engaging Indians to build a better India. In addition, TUI is a Bangalore-based group that has captured the imagination of people in cities such as Chennai, Hyderabad, Goa and Pune. Now they have made an impact in Coimbatore. With the slogan *Kaam Chalu Mooh Bandh* (Stop talking, start doing), they are on a mission to clean filthy bus stands, open dumps, paan-stained walls and dirty roadsides of their cities (Nath, 2014).

The Ugly Indian is about using guilt as the motivating factor to get Indians to take action and make positive changes. They highlight everyday issues and frustrations that millions of Indian face and have now developed a high level of tolerance for – littered pathways, stained walls, open urination, potholes etc. The aim is to shock and move Indians to take action, and still today, they have been pretty successful in their approach (Chaudhary, 2011).

In Bangalore, they have completely transformed certain streets and locations with the help of local residents and are gaining huge traction everyday. The group behind this initiative prefers to stay anonymous and believes that it's not so much about the money and systems but people's attitude and behavior that can make a radical difference in the kind of India we would like it to be (Chaudhary, 2011).

Ugly Indians believe in direct action, with a common-sense problem-solving approach. They aim to make a change from within - one that sustains because everyone wants it and is comfortable with it. They view the problem of visible filth on our streets as a behaviour and attitude problem that can be solved in their lifetime. It requires coming up with smart ideas to change people's rooted cultural behaviour or attitudes and making sure, those ideas work.

For members of TUI, social change begin with an attitude transformation:

It is time we admitted that many of India's problems are because many of us are Ugly Indians. Look at any Indian street, we have pathetic civic standards. We tolerate an incredible amount of filth. This is not about money, knowhow, or systems. This is about attitudes. About a rooted cultural behaviour. The Ugly Indian can take the world's best system and find a way around it. Streets in Indian-dominated suburbs overseas are good indicators of this lack of civic sense. It is time for us to do something about this. Only we can save us. From ourselves (TUI, 2010).

The Ugly Indian is a story about hope and optimism. According to the Ugly Indian members "we are part of the problem and only we can solve it. It means that we believe that change is possible in our lifetime" (TUI, 2010).

In fact, Bengaluru was the first city that started seeing transformations on its streets. From betel leaves stains on walls, to potholes on footpaths, to piled up garbage on the pavements everything is fixed by them (Farooqui, 2017).

1.2. Guideline of the project

The main values that guide the Ugly India project are the following:

- No lectures, no moralising, no activism, no self-righteous anger.
- No confrontation, no arguments, no pamphlets, no advocacy.
- Do not step on anyone's toes; do not take sides in any ideological debates.
- Support existing systems and improve their effectiveness for the greater good.
- Treat everyone with sincerity, respect and dignity. The greater good will be an outcome. Get real.

1.3. Solutions proposed

The Ugly Indian fellows consider their work as a real solution only if:

- It sustains in the public street for at least 90 days.
- With no supervision.
- Is low-cost (ideally free) and easy to implement and replicate
- Changes the behaviour and attitudes of all concerned
- Creates minimal change in the daily actions of everyone concerned (nobody should lose a job, lose a source of income, or get seriously inconvenienced – because it takes only one Ugly Indian to undo the good work of a hundred others).

Products created

Followers of Ugly India have intervened favorably in the public spaces of the cities since they have created different services that contribute to the hygiene of its inhabitants.

- *TereBins:*
these are dustbins provided by TUI for public use. TereBins weigh around 20–25 kilograms (44–55 lb.) and they are meant for paper cups, banana skins, cigarette packets and similar small litter. TUI provides tereBin service – which involves identifying ideal locations, installing the bins, setting up a daily clearing system and integrating with the local garbage clearance system and daily supervision (The Ugly Indian, 2014).
- *WonderLOO:*
this is an open urinal that protects the privacy of the users. The loo is unmanned and free to use. As of 2014, some 10 urinals are in operation. TUI, in association with the local BBMP office, ensures that each wonderloo is cleaned twice a day (The Ugly Indian, 2014).
Wonderloo is an open urinal without being nasty or compromising with the privacy of the users. The silent revolution the group has brought in and around MG Road, while remaining anonymous, is something the BBMP could emulate. According to TUI, wonderloos are a successful model, as the absence of a building does not leave any room for unlawful activities. The user-friendly wonderloo has public acceptance and pure functionality (Manjusainath, 2012).

Philosophy

Indian citizens do not hold ourselves responsible for the public filth we live in whether it is dirt on the footpath, paan stains, open garbage dumps, public urination, etc. This is precisely the attitude that TUI is trying to change by mean of a strong sense of personal accountability for our public surroundings, their mission is to *spot-fix* one dirty street at a time (Jadeja, 2014).

The idea behind that is to get citizens to take ownership of the work they do by spot-fixing unclean streets as opposed to labeling and making it about specific individuals and taking away from the actual cause. They want to inspire other Indian cities to follow suit (Jadeja, 2014).

Regarding to TUI associates:

Many people see India as a third-world country. India is bigger than this. Moreover, certainly we deserve to live in a better environment. It is a slow process to have an integrated India, but we are getting there. And though we may be ugly Indians, one thing we are trying to instill is that this is a common problem. We need a public solution. Be the change you want to see in the world.

1.4.

The Ugly

Indian: lead your own way

TUI, whose members prefer to remain anonymous, has been quietly making a difference in Mumbai since 2013. The group is leaderless as the belief is they do not require a face to represent their organization. Names and identities of the *Ugly Indian* remain hidden and they reply to the media only via mail (Farooqui, 2017).

The group refuses to depend and blame civic bodies and maintain that people need to take responsibility for the cleanliness and maintenance of their localities (Mohandas, 2015). After fixing several filthy spots across Bangalore, this activist group is going national. They have change streets, walls, etc. in cities such Mysore, Coimbatore, Chennai, Mumbai and the National Capital Region (Times of India, 2014).

If a voluntary group of citizens can come together and help, beautify and clean cities, imagine what the Power of 49% of the country can do. Get together. Get aware. Make an informed choice (Mohandas, 2015).

1.5. Values' campaign

"Want to change the world? Start with your own street," believe The Ugly Indians (Mohandas, 2015). Since 2010, the group has fixed many spots through its campaign *Spotfix*. If people do not want to do the ugly work, drop a message on Facebook and The Ugly Indians will take care of it (Farooqui, 2017).

Spot-fixing, according to the group, involves cleaning of mounds of garbage thrown on footpaths and roadsides, removing posters and stains on walls and painting them clean (Times of India, 2014). This mission is to *spotfix* dirty street by dirty street and inspires confidence throw their ugliness challenge. They choose small stretches each week to clean: pavements piled up with plastic, defaced walls, footpaths rendered unusable by potholes (Hariprakash, 2011).

The Ugly Indian (TUI) lead volunteers to mini landfills and ugly street corners to apply *spotfix*, a temporary cleanup and touchup of local infrastructure to work around an apathetic system caught in red tape and educate an urban community struggling with waste management (Chatterjee, 2014).

Their clean up drives are an inspiration to many, and TUI is an offshoot of Whitefield rising. Now, Indian people is care for local civic communities engaged in cleaning up their neighborhood. Based on the success of TUI in Bangalore, people have also begun their own citizen's clean up drives (Mohandas, 2015).

They say their spot-fixes are low-cost and easy to implement, replicate and create minimal change in the daily actions of everyone concerned. People really like how this spot fix conforms to the idea of not trying to make it an art space but rather just a clean a functional public space. Much easier to execute and maintain (Chatterjee, 2014).

“The best part is the anonymity factor,” says one of the TUI members. “We do not have to put a face. The aim is to get people out of their comfort zones to clean their living space.” The Coimbatore group consists of lawyers, entrepreneurs, students and activists. For one of the group participants “waste disposal has become a huge crisis. These collective initiatives motivate residents. Unless we manage our wastes, we cannot control the stray dog population in the city” (Nath, 2014).

The volunteers pick up the empty bottles and plastic bags. The TUI volunteers plan to gather once again on the same spot to give the final touches. In their own words, “we hope to move to other places, too. However, with this, we want to sow the seeds of a movement. It is our city, after all. Who else will take the initiative?” (Nath, 2014).

At last count, the Ugly Indians had fixed 104 spots - two per week - mostly around Bangalore's central business district, including MG Road, Brigade Road and Church Street. The group says most people do not even know each other's' names - the work takes place silently. Anonymity is a big attraction - many members are fairly senior corporate leaders. Also part of the operation are 150 bins, maintained and cleaned by the group and seven free-to-use WonderLoos - ecofriendly waterless toilets (Hariprakash, 2011).

For one of the members, “anonymity is a hugely successful strategy. Labels take away all the good work. Then it becomes so-and-so's movement”. Other member said: “We even refused funding because we don't want people to tell us they want their name or logo on it. We want people to take ownership. Which is why they can help by sharing labour, lending skilled masons, painters. Or by sponsoring bins” (Hariprakash, 2011).

The Ugly Indian defines itself as a faceless, leaderless volunteer organization. “We are media-shy and prefer if our work does the talking. In fact, they did not want to be identified. In their words, “we have no physical existence. We don't need an office, because our work is mainly on the streets” (Kumar, 2011).

The group's founders may conceal their identity, but they are very open in their criticism of their fellow citizens. “It's time we admitted that many of India's problems are because many of us are Ugly Indians- We tolerate an incredible amount of filth” (Kumar, 2011).

The organization follows a straightforward operation structure, wherein members self-select themselves via email and volunteers are filtered. The group also boasts of an equal number of men and women and refrains from calling itself an NGO, preferring instead to be referred to as a group a of self-driven and motivated people who come to work and not to socialize (Jadeja, 2014).

Various spot-fixes across the country have been reported and the results are visible. The movement is fast spreading and it is easy to see why. It tackles an issue that that is so fundamental to our everyday lives that it is hard to ignore (Jadeja, 2014).

2. FINAL CONSIDERATIONS

Real world change is happening. The Ugly Indian is just acting. Volunteers come together in their droves and change their local area for the better. They clear and clean up, adding bright licks of paint to once down-and-out facades. This is about creating public spaces for the people that people are proud of, and want to look after (Knowles, 2016).

The Ugly Indian's name is deliberate. Embedded in the self-conscious name is both a personal acceptance of a condition, and the responsibility to change it. The volunteers responsible for this transformation are ordinary people. To ensure the mission focuses on the work and not the individuals, a policy of strict anonymity is encouraged. The focus is on the results, rather than who achieves them. The Ugly Indians want to get away from ugliness and move towards beautification. The first step in solving the problem is accepting the problem (Rueckert, 2016).

Their action inspires other to follow suit. This revival of community vigour comes from India. Even the country's government acknowledges that too often public spaces become glorified dumping grounds. Today the movement is impacting thousands more communities (Knowles, 2016).

The Ugly Indian, an uncategorizable Bangalore-based community organization, has a fresh approach towards solving the problem of urban cleanliness; an approach that starts with acknowledging that Indians have abysmal standards of public hygiene; an internalization that "We Ugly Indians are part of the problem and only we can fix it" (Vishy, 2011).

The Ugly Indian is organizing cleanup drives in cities, mobilizing volunteers to spruce up parts of the city where garbage has been dumped, walls have been stained and pavements have crumbled. For TUI members, "it is time we admitted that many of India's problems are because many of us are Ugly Indians, due to we tolerate an incredible amount of filth" (Durai, 2012).

The group believes that Indians lack civic sense, wherever they live in the world. "Streets in Indian-dominated suburbs overseas are good indicators of this lack of civic sense. It is time for us Ugly Indians to do something about this. We are working hard to beautify India. In consequence, we will become Not-So-Ugly Indians" (Durai, 2012).

TUI has already made a difference in some prominent areas of the city. Volunteers cleaned up one major intersection and monitored it for two weeks. "We identified who dumps there everyday, requested them to stop. Helped them with an alternate system when they could not figure one out on their own. This is all about changing the Ugly Indian's behavior" (Durai, 2012).

In words of TUI members, "We don't want to interfere in the daily lives of all these people, we don't want to affect their livelihood, and we don't want to lecture anyone about recycling. We want to achieve our single-minded aim (that the garbage should go directly to the lorry and never reach the footpath) with minimum change in daily behaviour of everyone else concerned" Vishy (2011).

The Ugly Indian cannot over-emphasize how important this is – try to achieve what you want with minimal/no change in other people's lives. You have to accept that others directly involved might not think like you or have the same priorities. Most are living on the edge, fight for daily survival, and are invisible and faceless to those who read posts like this! Vishy (2011).

In addition, The Ugly Indian, whose motto is *stop talking, start doing*, is showing us that moralising, debating, and blaming will lead us nowhere till we pick up broomsticks and paintbrushes in our own hands and get to work (Kapoor, 2015).

With a name aimed at making people aware of these unsavoury habits, The Ugly Indian began as an attempt to understand why we have such low civic standards and tolerate incredible amounts of filth on the streets. They are deeply concerned about the city's environmental health and its public hygiene. Initially, the group spent time observing and understanding the systems and building trust with the various stakeholders (Bhagya, 2010).

Creating awareness for the need of community involvement fueled by individual effort in such issues has been the main focus of the project. They believe that people are extremely keen about improving the condition of their surroundings and just need a spark or catalyst to get them going. The Ugly Indian is about giving people this spark. Through the project they want to convey that it is possible for any individual, with no authority, money, volunteers or influence, to create a sustainable change in his or her surroundings (Bhagya, 2010).

REFERENCES

- Bhagya, C.S. (2010). You can change your city. *DNA. Daily News Analysis*. Retrieved from: <http://bit.ly/2fuGBJu>
- Chatterjee, R. (2014). The Ugly Indian Project: Civic Volunteers Clean Up City Because No One Else Will. *HuffPost India*. Retrieved from: <http://bit.ly/2xBHDcI>
- Chaudhary, D. (2011). The Ugly Indian or The Better India—What is your Take? *Duttee Social good startups, social media&other world changing stories*. Retrieved from: <http://bit.ly/2hta47d>
- Durai, M. (2012). The Ugly Indian gets a facelift. *Khabar*. Retrieved from: <http://bit.ly/2xBEtFX>
- Farooqui, M. (2017). The Ugly Indian: How this group is cleaning India's mess. *Money control news*. Retrieved from: <http://bit.ly/2xBHw0M>
- Hariprakash, V. (2011). 'Ugly Indians' clean up Bangalore. *BBC News*. Retrieved from: <http://bbc.in/2y45W4J>
- Jadeja, K. (2014). The Ugly Indian: Because Each One Of Us Is Responsible For The Ugly India. *Youth Connect*. Retrieved from: <http://bit.ly/1ic4JMG>
- Kapoor, V. (2015). How an Anonymous Group of People Came Together to Paint over 250 Flyover Pillars in Bengaluru. *The Better India*. Retrieved from: <http://bit.ly/2xC88yV>
- Knowles, K. (2016). We can all learn from The Ugly Indian. *The Memo*. Retrieved from: <http://bit.ly/2wOYGJz>
- Kumar, R. (2011). Are we all the Ugly Indians? *The New York Times*. Retrieved from: <http://nyti.ms/2yCFH21>
- Manjusainath, G. (2012). Nature calls, but nowhere to go. *Deccan Herald*. Retrieved from: <http://bit.ly/2wh85FG>
- Mohandas, M. (2015). Cleaning up India: The Ugly Indian. *Jaagore*. Retrieved from: <http://bit.ly/2hrYb12>
- Nath, P. (2014). The Beautiful Ugly Indian. *The Hindu*. Retrieved from: <http://bit.ly/2whILiu>
- Parekh, D. (2011). The Ugly Indian shows us the way. *The better India*. Retrieved from: <http://bit.ly/2fMiSBh>
- Rueckert, R. (2016). Lessons from the Ugly Indian. *Deliberate wanderer*. Retrieved from: <http://bit.ly/2jYz1bl>
- Stairs, D. (2012). Brushin' Up B'galore. *D-A-P. Design altruism project*. Retrieved from: <http://bit.ly/2whIxE>
- Times of India (2014). The Ugly Indian goes beyond Bangalore. *The Times of India city*. Retrieved from: <http://bit.ly/2xFQBWJ>
- TUI (2014). The Ugly Indian Fan Page. *Blogspot*. Retrieved from: <http://bit.ly/2wQjKzy>
- Vishy (2011). The Ugly Indian's Gift to Bangalore on the occasion of Namma Metro Launch. *TechSangam. Social Enterprises. India social entrepreneurs*. Retrieved from: <http://bit.ly/2xGbotq>

Helping Students Write Better Sociology Essays Using Concept Maps

Nawal Adibah KASSIM

*Maktab Duli Pengiran Muda Al-Muhtadee Billah
Department of Schools, Ministry of Education,
Brunei Darussalam
nawalkassim@hotmail.com*

Jainatul Halida JAIDIN

*Sultan Hassanah Bolkiah Institute of Education
Universiti Brunei Darussalam
halida.jaidin@ubd.edu.bn*

Rosmawijah JAWAWI

*Sultan Hassanah Bolkiah Institute of Education
Universiti Brunei Darussalam
rosmawijah.jawawi@ubd.edu.bn*

Rohani MATZIN

*Sultan Hassanah Bolkiah Institute of Education
Universiti Brunei Darussalam
rohani.matzin@ubd.edu.bn*

ABSTRACT

This study aimed to investigate the effects of concept mapping, a constructivist learning tool on ‘A’ level students’ sociology essay writing. This study was carried out in two cycles, each comprised pre- and post- stages involving four lower sixth students from a sixth form centre in Brunei Darussalam. Collaborative concept mapping was carried out during the intervention stage in both cycles. Objectives of the study were to; (i) find out how concept maps can be used to develop students’ conceptual understanding in sociology, (ii) identify the changes that take place in students’ sociology essay writing when using concept maps. Essays collected from pre and post stages were compared to obtain findings. Results showed the effectiveness of concept mapping in developing students’ sociological conceptual understanding as well as in planning and structuring ‘A’ level sociology essays. However, findings from this study revealed that students preferred to construct their own concept maps, as it would reflect their own individual understanding of the subject. It is therefore recommended that concept-mapping skills should be developed in sociology lessons so students could construct their own concept maps to improve their sociological conceptual understanding as well as sociological essay writing skills.

INTRODUCTION

This study aimed to investigate the effectiveness of collaborative concept mapping on the students’ thinking and writing skills. The study took place in a sixth-form college in Brunei Darussalam. The education system in Brunei is codenamed SPN 21, or in Malay, Sistem Pendidikan Negara Abad 21 (Ministry of Education, 2012). SPN 21 focuses on the development of critical thinking skills among the 21st century learners, emphasising on the process of knowledge building which involves students constructing ideas and understanding through interpretation, analysis, synthesis and evaluation (Innovative Teaching and Learning, 2011). It is argued that sociology can be used as a platform for educators to prepare learners with 21st century skills suitable for 21st century careers as it cultivates creativity, innovation, critical thinking, analytical problem-solving skills and communication skills (American Sociological Association, 2005). Goldsmid and Wilson (1980) postulated that among the learning goals in sociology is to develop the students’ critical thinking skills.

However, one of the common mistakes made by students in ‘A’ level sociology examination is their misinterpretation of key terms and key concepts in the questions (Cambridge International Examinations Learner Guide, 2014). Sociological concepts have definite meanings and these meanings need to be understood by the students for them to be able to understand what is being asked by the essay questions accurately. Concept maps have been extensively employed and experimented as pedagogical tools (Novak & Canas, 2007). The idea of concept mapping was first developed by Novak in the 1960s in his attempt to visually portray the structure of information (Novak, 1991). Novak (1991) used concept maps to assess children's understanding of science using the graphical tools in concept maps to organize and represent the students’ knowledge (Novak & Gowin, 1984). Collaborative concept mapping or constructing concept mapping in a group setting differs from individual concept mapping as it involves two or more individuals constructing the concept map to learn and construct knowledge (Gao, Thomson & Shen, 2013).

The increased significance on writing assignments in higher education could be a reflection of the stronger connection between writing and knowledge production in today’s information era (Warschauer & Ware, 2006). However, writing is more than merely weaving words and sentences together. A lot of preparation, which includes planning, brainstorming, drafting and modifying, need to be done in order to produce successful writing (Al-Shaer, 2014).

Ideally, a well-written academic assignment demonstrates more than grammatically correct sentences (Villalon & Calvo, 2011), and it should display the writer’s deep understanding through both the producing and evaluating the content (Paltridge, 2004). Negari (2011) investigated the effects of concept mapping on the writing skills of English as a foreign language (EFL) students. He gathered that concept mapping helped boost the students’ conceptual understanding and this helped them organize their thoughts using the graphical tools. It was also found that concept mapping could enhance the students’ creativity as well as their retention, understanding of content, problem-solving skills and their performance in class (Negari, 2011).

In this study, collaborative concept mapping was used to assist students write better essays in ‘A’ level sociology examination. More specifically, this study aimed to address the following research questions:

- (1) How can concept maps be used to develop students’ conceptual understanding in ‘A’ level sociology?
- (2) What are the changes that take place in students’ sociology essay writing when using concept maps?

METHODOLOGY

The present study employed action research as its research design. The action research took a total of two cycles: (i) The first cycle was a preliminary cycle, which looked at the effectiveness of concept mapping on students’ writings for a short answer question designed by the researcher; (ii) The second cycle examined the effectiveness of concept mapping on the students’ writing for a short essay question which is obtained from past year exam paper set by the Cambridge Examination Board. Each cycle comprised several stages that started with pre-test, followed by intervention, post-test, informal interview and finally, analysis. Data were derived using pre- and post-tests as well as informal interviews after the intervention took place. In this study, the researcher also played the role of the teacher.

Informal interviews with open-ended questions were also conducted with each of the students. Purpose of the interviews was to gain more insights into the students’ thoughts on the effectiveness of concept mapping in developing their sociological conceptual understanding and their essay writing skills. During intervention stages in both cycles, the teacher and the students collaboratively constructed concept maps and these concept maps were drawn on the whiteboard. Collaborative concept mapping is when two or more individuals and in the case of this study, the researcher and the participants engaged actively in creating the concept maps together (Gao, Thomson & Shen, 2013).

In the current study, the teacher initiated by asking the students questions and later mapped out their responses on the concept map. The intervention stages focused on the usefulness of concept mapping as tools to assist with the development of sociological conceptual understanding and in organizing their understanding. Students' essays obtained during pre- and post-test stages were analysed and compared to map out the changes that concept mapping has on the their conceptual understanding and writing skills.

Participants of the study

The participants of this study comprised four students from the lower sixth sociology class in a sixth form centre in Brunei Darussalam. The participants were between the ages of seventeen to eighteen years old.

Marking Criteria (Pre-test and Post-test)

Students' answers for the first cycle were graded using a marking scheme developed by the researcher as shown in Table 1. Different marking schemes were used in each cycle of the study. The second cycle used a marking scheme obtained from Cambridge International Examination Board as shown in Table 2.

Marks	Requirements
0	No attempt to answer the question.
1	Answers at this level are likely to focus on Functionalism as a perspective with no attempt to link this perspective to the society.
2	At this level, answers contain links between Functionalism and the society. However, no attempt to explain the similarities between society and the human body.
3	An explicit explanation of the Functionalists view on society like a human body but no examples are included for support.
4	Answers at this level are explicit and sustained with sociological examples.

Table 1: Marking scheme for Pre-test and Post-Test in cycle 1

Marks	Requirements
0 - 4	Answers at this level are likely to focus on functionalism in general rather than the concept of social order specifically. A few simple points about functionalist theory would be sufficient to trigger the top of the band.
5 - 8	A sound reprise of functionalist theory, with links to social order perhaps left largely implicit, would be worth 5 or 6 marks. A good descriptive account of the functionalist theory of social order i.e. with little or no assessment, could reach the top of the band.
9 - 11	At this level, answers must include some evaluative commentary that identifies strengths and/or limitations in the functionalist theory of social order. Lower in the band the assessment may be delivered mainly through juxtaposing functionalism with other theories of social order. To reach the top of the band, however, the assessment of functionalist theory must be explicit and sustained.

Table 2: Marking scheme for Pre-test and Post-test in cycle 2

FINDINGS

A total of eight answers for short answer questions from cycle 1, eight essays from cycle 2 and eight concept maps from both cycles were collected. A summary of these answers, essays and concept maps are discussed in the following sections.

Table 3 shows an overview of the marks for all the students for both cycles. It shows the increase of marks in the post-test after the interventions in both cycles for all four students.

	Cycle 1 Tests		Cycle 2 Tests	
	Pre-test (Total marks 4)	Pre-test (Total marks 4)	Pre-test (Total marks 11)	Pre-test (Total marks 11)
Student A	2	3.5	3	6
Student B	3	3.5	5	9
Student C	2	3.5	4	6
Student D	2	3	1	5
Mean	2.25	3.375	3.25	6.5

Table 3: Pre-test and Post-test Scores in cycle 1 and cycle 2

Findings from Cycle 1

Findings from cycle 1 also revealed the ways in which concept mapping was effective in developing the students' sociological conceptual understanding and the changes that took place in their answers after using concept maps. The main sociological concepts that were used in the question were the terms Functionalists, Society and Human Body. The term Functionalists is a basic sociological concept referring to a sociological perspective, which all sociology students need to understand in order to move forward in the subject. The term Society however is a general term, which is not specific to sociology therefore, students need to understand the term Society in its sociological context and the term Human Body in the question needed to be understood in relation to the sociological concept of Society.

Basing their marks on the marking scheme, the students' answers have developed from containing links between Functionalism and Society but no attempt was made to explain the similarities between Society and The Human Body in the pre-test stage to answers containing explicit explanations of the similarities in the Functionalists' View of Society with a Human Body with supporting examples and evidences in the post-test stage.

Following are the effective ways in which concept mapping helped to develop the students' conceptual understanding in Sociology and the changes they have on their answers as found in the first stage of the study:

Firstly, the findings found the effectiveness of visually linking in the concept map the different sociological concepts to form deeper understanding. Below are excerpts of student A's pre-test and post-test answers in cycle 1 after using a concept map:

Student A's Pre-test Answer:

So, the Functionalists view society like a human body as every parts of society helps to keep society going by perform together.

Student A's Post-test Answer:

Functionalists view society as a human body, which need organs that are interdependent and immune system to perform together and hence it will create healthy body. Without one of them, human body cannot function well, same as the society. If social institution and social forces are absent, society will not function well and leads to dysfunctional in the system. Hence, no social order is created.

In sum, student A's post-test answer illustrates links between the Functionalist View on Society and the Nature of Human Body. Similarly, student D's pre-test and post-test answers showed significant changes after using concept maps, as illustrated below:

Student D's Pre-test Answer:

Every part of the human body works together, which is the same as the social institutions, every part of the institution work together to shaped the society. Functionalists see society as complex system whose parts work together to promote social solidarity and stability.

Student D's Post-test Answer:

The Functionalists views society like a human body because human body has organs or body parts which is same like the society having social institutions. Also, the human body have an immune system which in the society they have social forces.

Both student A and D's post-test answers display the effectiveness of concept mapping in developing answers that reflects deeper thinking and ideas.

Secondly, the findings present the effectiveness of visually expanding the concepts by giving examples in the concept map for more supported answer as evident in the excerpts below:

Student B's Pre-test Answer:

In the Functionalism, individuals are viewed as passive products of social institutions.

Student B's Post-test Answer:

Individuals are passive products of the society for which the society shape individuals via social institutions such as family media, religion and education. In order to keep the social system runs smoothly, social forces such as army and police are applied alongside these social institutions. When both social institutions and social forces exist in the social system, therefore social order can be achieved.

Student B's post-test answer shows a deeper understanding of various sociological concepts, which included examples of Social Institutions and Social Forces which the student then linked to the concept of Social Order.

Thirdly, findings from cycle 1 also found the effectiveness of concept mapping on visually linking the concepts in the questions to other related sociological concepts to create stronger arguments. Overall, findings from the first cycle and the students' post-test marks have displayed positive results on the effectiveness of concept mapping on developing students' conceptual understanding in 'A' level sociology.

These findings are further supported by the students' responses during the informal interviews. All four students agreed that the concept map had helped them to understand the question as well as the sociological concepts in the questions. Like the other three students, student C found the visual links between the concepts on the concept map to be helpful in helping them understand the links between the different concepts. All four students agreed that the concept map has helped them structure their answer better. Findings from the essays and the interviews during cycle 1 have justified the increase in marks for all four students in the post-test stage.

Findings from Cycle 2

In cycle 2, similar findings were found on the effectiveness of concept mapping on developing the students' conceptual understanding in sociology and the changes concept mapping had on the students' essays. Similar to the findings in cycle 1, there is an increase of mark for all four students in the post-test results after the intervention stage. The number of increase in marks however varied for each of the student. As outlined in Table 3, student B and student D gained the most increase in marks compared to student A and C.

In this cycle, student B scored the highest in the post-test stage in cycle 2. This student's answer developed from a reprise of Functionalist Theory, with implicit links to social order in the pre-test stage worth five out of eleven marks to juxtaposing the Functionalists View of Social Order with other theories with nine out of eleven marks in post-test stage. The link in the student's concept map was also evident in her post-test essay excerpts as shown below which contained juxtaposing views on Marxists and Functionalists view.

Student B's Pre-test Answer:

For Marxists, social order is achieved through the inequalities of power. Marxists view society as divided into two classes: Bourgeoisie and Proletariat.

Student B's Post-test Answer:

Unlike Functionalists who put a great deal of emphasis on collective conscience and consensus, Marxists believe that as long as the ruling class are in a state of false consciousness, social order will be maintained in the capitalist. In order for the society to function smoothly, repressive state apparatuses such as the police are used to keep the order in line.

The student's post-test answer is an evidence of the effectiveness of concept mapping in developing the students conceptual understanding of the concept Functionalism by visually linking the term to other sociological perspectives in the concept map. This has also led to the student writing an essay containing stronger arguments.

Another apparent evidence of the finding can be found in student D's post-test essay. Student D's pre-test essay focused only on Functionalism in general with neither links to social order nor assessing it with other theories which only gave this student one out of eleven mark. This student's post-test essay contained a sound reprise of Functionalist Theory with links to Social Order and an attempt to assess the Functionalists View with other theories worth five out of eleven marks. When asked if the concept map helped his understanding of the question better during the interview, he responded:

'Yes. It helped me organize what I should write in my essay. Also, it helped me understand that "assess" also means criticize which means I should not only write about the Functionalists view' (Student D).

This shows how concept mapping not only develop the student's understanding of the concepts in the question but it also helped the student understood the question overall. As revealed in cycle 1, the findings of cycle 2 also found the effectiveness of visually expanding the sociological concepts by giving examples in the concept map for more validated claims in the post-test essays.

In addition, the results found the effectiveness of concept mapping in improving the students' essay writing skills as all four post-test essays contain more coherent paragraphs than their pre-test essays. Each paragraph links back to the original theory in the question that is the Functionalists Theory of Social Order. Furthermore, during the interviews, all four students admitted that the concept map was indeed helpful in structuring and organizing their essays. Student A claimed that the concept map showed her which points came first and this helped her to prioritize her points. Student B elaborated more on her response by mentioning how the concept map had helped her to graphically structure her thoughts which in turn helped her structure her essay overall. This is in line with Jacobson's (2004) claim that concept maps are effective tools for meta-conceptual scaffolding as they allow students to visualize their own mental representations and thinking processes (Villalon & Calvo, 2011).

DISCUSSION

Overall, the findings found in both cycles were similar. Concept mapping was found to be effective in developing deeper understanding of sociological concepts by visually linking the main concepts in the questions to other related sociological concepts and theories. This is consistent with Kinchin and Hay 's (2000) assertion of how concept mapping is helpful in forming deeper understanding by linking one's fragmented understanding visually in the map. Drapeau (1998) also postulated how concept mapping helps generate new ideas, connect parts, draw sequence as well as analyze causes and effects and to enhance students' thinking skills. In this case, the findings displayed the effectiveness of concept mapping in developing the students' thinking skills in 'A' level Sociology, which according to Shepard (2005) is called Scaffolding. This is when teachers provide supports in the form of prompts to help students link new information to their existing knowledge, which as claimed, by Novak and Gowin (1984) could have been overlooked before making the map.

Concept mapping was also found to be helpful in expanding the understanding of sociological concepts by adding relevant examples in the map which enabled the students to write more supported answers. This finding is an example of how concept maps can be used to illustrate the different types of links between concepts as claimed by Schwendimann (2006). By relating arguments and claims in their answers to other sociological theories, concepts and examples using concept maps students have developed what Grauerholz and Bouma-Holtrop (2003) termed as critical sociological thinking which according to (2003) reflects one's higher-level thinking abilities. In this way, the study found how concept mapping could be used to develop students' higher-level sociological critical thinking. Additionally, by relating to examples and other sociological perspectives and concepts, Grauerholz and Bouma-Holtrop (2003) introduced the concept of critical sociological thinking to describe the competency to logically and reasonably evaluate sociological arguments or problems by referring to social forces and social context. From the essays gathered in cycle 2, concept mapping was also found to be effective in improving the students' essay writing skills particularly in writing more coherent essay content. A previous study by Negari (2011) concluded that concept mapping helped boost the students' conceptual understanding and this helped them organize their thoughts using the graphical tools. Furthermore, in the interviews, the students complimented the benefits of the visual links in the map in helping the understood the relationships and the links between the concepts in the questions, which in turn helped the students organize and structure their answers.

However, some striking findings also emerged in cycle 2. There were evidences to suggest that the students preferred to construct their own concept maps than constructing it collaboratively with the teacher. For example, in student B's post-test essay, she did not include part of the Interactionists' explanation on Social Order which she had included in her pre-test essay. When the student was asked during the interview about the missing part of the explanation in her post-test essay, she responded that because it was not included in the concept map therefore she did not think it would be necessary to include in the post-test essay. When asked if she would prefer to base the essay on a concept map that she had constructed herself, she said she would have done so as she would have a better understanding of the concept map. However, when asked further if she would employ concept mapping to revise the subject in the future, she honestly replied that she still prefers to write her understanding in words. In addition, student C's post-test essay excluded Marxists' concepts of Ideological State Apparatus, Repressive State Apparatus,

Althusser and False Consciousness. These concepts however were included in her concept map. When student C was asked to explain why she excluded these terms in her post-test essay when they appeared in her concept map, she admitted that she must have forgotten to include them as she was too focused on following the “busy” concept map when writing the essay. This is no surprise as she also claimed that although she understood the essay, there were parts, which she had difficulties putting into words. Like student B, student C also prefers to write essays based on her own constructed concept map.

All four students, who although claimed to understand the concept map constructed collaboratively with the teacher, confessed that they would prefer writing their essays based on concept maps that they had constructed themselves as they would reflect their own understanding. This concurs with Gao, Thomson and Shen (2013) claim on the process of knowledge construction in concept mapping differ from individual to individual based on their domain expertise and concept map procedure. Moreover, when asked if they would use concept map to plan their essay beforehand during exams, two out of four students responded they would not use concept mapping, as it is time consuming.

CONCLUSIONS

This study investigated the effects of using concept maps as a strategy to write ‘A’ level sociology essays among four Bruneian ‘A’ level sociology students. The results showed that all four students scored higher post-test scores. It was found that the use of concept maps was an effective strategy in developing the students’ conceptual understanding. The findings uncovered that the visual links in the concept maps really helped the students to visualize and understand the links and relationships between the sociological concepts, perspectives, theories as well as the links between the concepts or the theories and their examples. This goes in line with Mintzes, Wandersee & Novak’s (1997) conclusion on concept maps being the metacognitive tools which helps reflect one’s thinking using the visual representation of the relationships between the concepts and Negari’s (2011) claim that the graphical tools are useful in helping students organize their thoughts and boost their conceptual understanding.

As seen in the increase of the post-test scores, students’ post-test answers improved after the use of concept maps. Their post-test answers, which were not only longer and contained more details, but also reflected deeper understanding and contained stronger arguments with links to relevant sociological perspectives, theories and examples.

However, despite the effectiveness found on the use of collaborative concept mapping as a strategy to write ‘A’ level essays, it was striking to find that the students preferred to use their own self-constructed concept maps as these would reflect their own understandings of the topic. This finding agrees with Jacobson’s (2004) claim on concept maps being effective tools that allow students to visualize their own mental representations and thinking processes. Nevertheless, based on the results and findings of this study, it is safe to conclude that the use of collaborative concept mapping is an effective strategy in developing sociological conceptual understanding as well as in writing ‘A’ level sociology essays that are on par with the standards set by the Cambridge International Examination Board.

Findings from this study have significant implications for ‘A’ level sociology teaching and learning. The use of concept mapping can help develop students’ sociological conceptual understanding as well as develop their essay writing skills. Furthermore, by taking into account the findings from the interviews with the students, this study recommends ‘A’ level sociology teachers to incorporate concept-mapping in their classes (more specifically as a pre-writing strategy) as this could encourage students to construct their own concept maps to be used as pre-writing tools. This could also potentially help produce more independent learners. The introduction to concept mapping in sociology should start with simple and familiar topic until the students can successfully construct their own concept maps.

REFERENCES

- Abel, W., & Freeze, M. (2006). Evaluation of concept mapping in an associate degree nursing program. *Journal of Nursing Education*, 45(9), pp. 356-364.
- Al-Shaer, I. M. R. (2014). Employing Concept Mapping as a Pre-writing Strategy to Help EFL Learners Better Generate Argumentative Compositions Innovative teaching and learning. *International Journal for the Scholarship of Teaching and Learning*, 8(2), pp. 1-29.
- American Sociological Association. (2005). What is Sociology? Retrieved from <http://www.asanet.org>
- Applefield, J. M., Huber, R. & Moallem, M. (2001). Constructivism in theory and practice: Toward a better understanding. *The High School Journal*, 84 (2), pp. 35-53.
- Asia E-University. (2009). Metacognition and Constructivism. Education Psychology (online course). Retrieved from http://peoplelearn.homestead.com/beduc/chapter_6.pdf
- Bascones, J. NJ. (1985). Alternative instructional systems and the development of problem-solving skills in physics. *Eur J Sci Educ*. 7(3), pp. 253-61.
- Bruning et al. (2004). In Applefield, J. M., Huber, R. & Moallem, M. (2001). Constructivism in theory and practice: Toward a better understanding. *The High School Journal*, 84 (2), pp. 35-53.
- Cambridge International Examinations. (2014). *Learner Guide. Cambridge International As & A Level. Sociology*. 9699. Cambridge Advanced.
- Cambridge International Examinations. (2014). *Syllabus. Cambridge International As & A Level. Sociology*. 9699. Cambridge Advanced.
- Cambridge International Examinations. (2015). *Syllabus. Cambridge International As & A Level. Sociology*. 9699. Cambridge Advanced.
- Chang, K-E, Sung Y-T and Chen I-D. (2002). The effect of concept mapping to enhance text comprehension and summarization. *The Journal of Experimental Education*, 71(1), pp. 5-23.
- Cheek (1992). In Asia E-University. (2009). Metacognition and Constructivism. Education Psychology (online course). Retrieved from http://peoplelearn.homestead.com/beduc/chapter_6.pdf
- Drapeau (1998). In Hong Kong Curriculum Development Institute. (2001). The use of graphic organizers to enhance thinking skills in the learning of economics. Retrieved from http://www.edb.gov.hk/attachment/en/curriculum-development/kla/pshe/references-and-resources/economics/use_of_graphic_organizers.pdf
- Ertmer, P. A., & Newby, T. J. (2013). Behaviorism, Cognitivism, Constructivism: Comparing Critical Features From an Instructional Design Perspective. *Performance Improvement Quarterly*, 26(2), pp. 43-71. doi: 10.1002/piq.21143.
- Gao, H., Thomson, M. M. & Shen, E. (2013). Knowledge Construction in Collaborative Concept Mapping: A Case Study. *Journal of Information Technology and Application in Education*, 2(1), pp. 1-15.
- Geertsen, R. (2003) Rethinking Thinking about Higher-Level Thinking. *Teaching Sociology*, 31, pp. 1-19.
- Glaserfeld, E. V. (1995). *Radical constructivism: A way of knowing and learning. Studies in Mathematics Education Series: 6*. London: The Falmer Press.
- Goldsmid, C. A., & Wilson, E. K. (1980). *Passing on Sociology: The Teaching of a Discipline*. Washington, DC: ASA Teaching Resource Center.
- Grauerholz, L., & Bouma-Holtrop, S. (2003). Exploring Critical Sociological Thinking. *Teaching Sociology*, 31(4), pp. 485-496.
- Hammond, L. -D., Austin, K., Orcutt, S., & Rosso, J. (2001). *How people learn: Introduction to learning theories. The learning classroom: Theory into practice a telecourse for teacher education and professional development*. Stanford University School of Education.
- Henson (1996). In Asia E-University. (2009). Metacognition and Constructivism. Education Psychology (online course). Retrieved from http://peoplelearn.homestead.com/beduc/chapter_6.pdf
- Jacobson. (2004). In Villalon, J., & Calvo, R. A. (2011). Concept Maps as Cognitive Visualizations of Writing Assignments. *Educational Technology & Society*, 14 (3), pp. 16–27.

- Kinchin, I. M., & Hay, D. B. (2000). How a qualitative approach to concept map analysis can be used to aid learning by illustrating patterns of conceptual development. *Educational Research*, 42 (1), pp. 43–57.
- Kolb, D. (1984). *Experiential Learning. Experience as the Source of Learning and Development*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Livesey, C. and Lawson, T. (2008). *AS Sociology for AQA (2nd ed.)*. Sociology Central/Onlineclassroom.
- McAleese (1998). In Chang, K-E, Sung Y-T and Chen I-D. (2002). The effect of concept mapping to enhance text comprehension and summarization. *The Journal of Experimental Education*, 71(1), pp. 5-23.
- McLeod, G. (2003). Learning theory and instructional design. Retrieved from http://principals.in/uploads/pdf/Instructional_Strategie/learningtheory.pdf
- Ministry of Education. (2012). *The Ministry of Education Strategic Plan 2012-2017*. Strategic Management Unit, Ministry of Education: Brunei Darussalam.
- Mintzes, J. J., Wandersee, J. H. & Novak, J. D. (1997). Meaningful learning in science: The human constructivist perspective. In G.D. Phye (Ed.), *Handbook of Academic Learning: Construction of Knowledge*. San Diego: Academic Press. pp. 405-447. Retrieved <http://dx.doi.org/10.1016/B978-012554255-5/50014-4>
- Mundia, L. (2010). Implementation of SPN21 Curriculum in Brunei Darussalam: A Review of Selected Implications on School Assessment Reforms. *International Education Studies*, 3 (2), pp. 119-129.
- Negari, G. M. (2011). A Study on Strategy Instruction and EFL Learners' Writing Skill. *International Journal of English Linguistics*, 1 (2), pp. 299-307.
- Novak, J. D. (1991). Clarify with concept maps: A tool for students and teachers alike. *The Science Teacher*, 58, pp. 45-49.
- Novak, J. D. and Gowin, D. B. (1984). *Learning How to Learn*. Cambridge: Cambridge University Press.
- Novak, J.D. and Canas, A.J. (2007). Theoretical Origins of Concept Maps, How to Construct Them and Uses in Education. *Reflecting Education*, 3(1), pp. 29-42.
- Paltridge, B. (2004). Academic writing. *Language Teaching*, 37, 87-105.
- Rice, D. C., Ryan, J. M., & Samson, S. M. (1998). In Schwendimann, B. A. (2006). Making sense of knowledge integration maps. In D. Ifenthaler and R. Hanewald (eds.), *Digital Knowledge Maps in Education: Technology-Enhanced Support for Teachers and Learners*. doi: 10.1007/978-1-4614-3178-7_2
- Santiago, H. C. (2011). Visual Mapping to Enhance Learning and Critical Thinking Skills. *Optometric Education*, 36(3), pp. 125-139. Retrieved from http://journal.opted.org/articles/Volume_36_Number_3_VisualMapping.pdf
- Schunk, D. H. (2012). *Learning theories: An educational perspective (6th ed.)*. Pearson: Boston.
- Schwendimann, B. A. (2006). Making sense of knowledge integration maps. In D. Ifenthaler and R. Hanewald (eds.), *Digital Knowledge Maps in Education: Technology-Enhanced Support for Teachers and Learners*. doi: 10.1007/978-1-4614-3178-7_2
- Sharrock, T. (2008). The Effect of Graphic Organizers on Students' Writing. Unpublished action research, Kennesaw State University. Retrieved from https://commons.kennesaw.edu/gpc/sites/commons.kennesaw.edu/gpc/files/Paper%20Sharrock_0.pdf
- Shepard, L. A. (2005). Linking formative assessment to scaffolding. *Educational Leadership*, 63(3), pp. 66-70.
- Villalon, J., & Calvo, R. A. (2011). Concept Maps as Cognitive Visualizations of Writing Assignments. *Educational Technology & Society*, 14 (3), pp. 16–27. Retrieved from http://www.ifets.info/journals/14_3/3.pdf
- Warschauer, M., & Ware, P. (2006). In Villalon, J., & Calvo, R. A. (2011). Concept Maps as Cognitive Visualizations of Writing Assignments. *Educational Technology & Society*, 14 (3), 16–27. Retrieved from http://www.ifets.info/journals/14_3/3.pdf
- Weeger, M. A. and Pacis, D. (2012). A Comparison of Two Theories of Learning -- Behaviorism and Constructivism as applied to Face-to-Face and Online. *National University Learning*. Retrieved from <http://www.gcasa.com/conferences/manila/papers/Weegar.pdf>

Heuristic Test of Structure and Content Writing of the Websites

Leandro LUDENA-APOLO

*Grupo de Investigación y Comunicación web GICOWEB
Universidad Técnica de Machala
Ecuador
leaux10@gmail.com*

Jennifer CELLERI-PACHECO

*Grupo de Investigación y Comunicación web GICOWEB
Universidad Técnica de Machala
Ecuador
jcelleri@utmachala.edu.ec*

Jorge MAZA-CORDOVA

*Grupo de Investigación y Comunicación web GICOWEB
Universidad Técnica de Machala
Ecuador
jlmaza@utmachala.edu.ec*

ABSTRACT

In this paper, we analyze and compare the attributes related to the structure and writing of web content of the usability guidelines that are freely accessible. This selection serves as the basis for the development of a heuristic test to evaluate the quality of content published on websites. The test evaluates the content from the dimensions of structure, writing and graphic design. At the end, a complete analysis of the evaluation is presented in a quantitative and qualitative way. Unlike other tests, it will be hosted on the web; and, it can be used by any user specialized in web communication and development.

INTRODUCTION

Web sites are built and classified according to the needs that users seek to satisfy (Alonso, 2008). Usability allows users to properly understand the operation of a product in general, however in the field of computing is to define whether a user can positively or negatively meet their needs when interacting with some computational element (Baeza- Yates, Rivera-Loaiza, & Velasco-Mertín, 2004). The terms of accessibility and usability are often confused, but when evaluating both criteria, only some basic aspects are directly related (Serrano, 2009). Usability and accessibility are part of the quality of software products that interact with the human side to provide a better user experience (Moyano, Gaetán, & Martin, 2016). According to Carrión (2014), the success of a website is achieved if users can make use of its benefits. Therefore, user-centered web sites must be developed, that is, their functions and graphical interface are aimed at meeting the needs and meeting the objectives of their audience (Rodríguez, González, & Pérez, 2017).

According to the experience of Mordecki (2010) the classification of information in a website merits a very arduous work, gray areas are often created and problems of ambiguity, in his study half of the documentation was very difficult to classify. As Benigni (2011) mentions, we must be aware and begin to think in terms of usability and establish strong dialogues with users. In this sense, usability allows us to capture the maximum possible attention of users without feeling lost or trapped in any section of the site.

In a website that lacks usability users will easily lose interest in following it and according to the impact they might end up abandoning it definitively, a good web design seems to reduce the cultural differences between users of different countries that access the same website (Alcántara-Pilar & del Barrio-García, 2016/5). It is important to note that the more user-friendly the websites, the better the chances of improving rankings such as Alexa, among others (Benigni & Zabala, 2015).

Alexa ranks rankings of the most used sites without distinction of the type of institution to which it belongs, according to Gonzalez (2013) the quality of a website is not directly proportional to the size of the company and more and more companies are concerned about improve the quality of your website.

For this reason there are usability mechanisms that offer a set of recommendations for those who are in charge of the development and maintenance of web sites in order to perform the tasks proposed in the website, in an efficient and error-free way (Fernández-Cavia, and others, 2013). Neisen (1999), considered one of the parents of usability, establishes that high quality content, frequent updating, minimum download time, simplicity of use, relevance of content to user needs, that the web reflects a network-centric organization are the main reasons for a user to re-visit the website.

Many organizations develop guidelines and standards to evaluate the usability of websites that can be mentioned to ISO, Userfocus, HHS Guidelines, UsabAIPO, among others. ISO standards are the most recognized but those that provide software quality standards are under restriction because they have an acquisition cost and as a consequence very few use them (Mordecki, 2012). It is important to emphasize that none of the usability guidelines can be defined as fixed rules (Carreras, 2012). There are also many contributions regarding the way in which usability should be evaluated and each one analyzes the properties that he / she has deemed appropriate, using his / her own methods to determine the results (Suárez Torrente, 2011).

It is very common to find methods to evaluate the usability of websites, among them heuristic evaluation and user test. The heuristic evaluation consists in elaborating a list of criteria that allow us to calculate by percentage or some quantifiable measure the usability of the site. On the other hand, the user test is based on applying a sequence of tasks or instructions to a particular user to perform them on the website and thus determine the level of usability (Prefasi Gomar, Magal Royo, Garde, & Giménez López, 2010). The results of both methods allow webmasters to take corrective action to give users a better browsing experience on websites.

Web pages should guarantee a minimum of quality characteristics, so that they allow users to have confidence in the contents that are published in them (Pérez et al., 2010), for which it should be emphasized that one of the reasons for that users leave the websites is how their content is drafted. Due to the importance of text and multimedia files to communicate and socialize in a non-face-to-face manner (López-Andrada, 2016). Currently, users not only read on the web but also interact with it, even generating content (Gutierrez, 2008). In a study carried out on web development it was revealed that the users have a different behavior when reading on the screen than when doing it in print, so it was concluded that the content to be published on the websites should be different (Táran León, 2007). Usually users place the look initially in the footer and in the margins of the text, and then go to examine the main content (Rodríguez López, 2011). Therefore, the content of websites should be clear and concise for the audience and this can be achieved by using webwriting techniques and a well-organized easy-to-understand language. It should be emphasized that there is a large number of users that access information hosted on the Internet, therefore the writing of the information should be addressed to any type of user (Oliván, 2001).

In addition to providing adequately worded content, web sites are an ideal showcase for making themselves known (Vielba & Clemente, 2008), and thus, presenting themselves under a structure that ensures they meet the objectives of the audience in a clear way, without too many depth levels of information, as Maniega-Legarda (2006) states, it is easier to remember few elements at a time in different steps than many in a single page. One of the disciplines that is in charge of the structure, organization and labeling of information elements is the Information Architecture (AI) (Pérez Montoro, 2010). The AI provides the user with an interaction with the information on the website, simply and simply (Mosque Sales & Bentes Pinto, 2016). For a better appreciation of AI, the interfaces of a system must be user friendly and support simple visual elements (Paz Enrique & Cuellar Santos Suárez, 2016) and web design must maintain a strong and consistent visual hierarchy (Gutierrez, 2008). Consequently, the structure of the information must be accompanied by an adequate web design, avoiding any kind of distractions that may cause a delay in the activities that the user wishes to perform on the website.

Although there are evaluation methods for usability, the scenario for the evaluation of the structure and content writing is very different. When reviewing the bibliography and analyzing different investigations, we found studies using software and mathematical formulas to evaluate the readability of websites (Hilera González, Fernández Sanz, & Suárez Morón, 2012) but no new studies have been registered that evaluate the structure and writing web content through human participation and that is applicable to all types of websites. However, a heuristic test can be of greater benefit than software, due to the interpretation provided by the experts and the different recommendations that can generate based on their knowledge and experience.

According to this premise, the purpose of this article is to develop an online heuristic test of free access, which allows users to evaluate the level of structure and content writing of any website. The results will be obtained in a quantitative and qualitative way.

METHODOLOGY

It begins with the analysis of content and synthesis of the information about the different contributions and guidelines proposed worldwide on the structure and drafting of web content, among which are those presented in the blog Usable and Accessible of Careers (2012) and the guidelines of the UsabAIPO Initiative (2004).

After the analysis a method of comparison between the previously analyzed guidelines is applied to determine which will be the basis in the elaboration of the heuristic test and finally the online test is elaborated.

There is no authorized regulation that establishes guidelines to produce quality content and that can be implemented by the different means of communication existing, among these means are located the websites. Each communication medium sets its own guidelines for generating quality content (Mordecki, 2012). Therefore, this study establishes the following characteristics to compare the guidelines: appearance of text, headings and titles, findable content, multimedia, content organization and interface design depending on the content structure.

All the guidelines compared in Table 1 contribute to the present research and are found free of charge on the web.

¹ Access Links To Compared Guidelines:

HHS Guidelines: <https://guidelines.usability.gov/>, Directrices de Userfocus: <http://www.userfocus.co.uk/resources/guidelines.html>, Nielsen Norman Group Guideline: <https://www.nngroup.com/articles/ten-usability-heuristics/>, Swedish National Guidelines for Public Sector Websites: <http://www.standards-schmandards.com/2008/swedish-guidelines-for-public-sector-websites/>, SIRIUS: <http://di002.edv.uniovi.es/~cueva/investigacion/tesis/Sirius.pdf>, Australia Government Usability: <http://www.finance.gov.au/archive/user-profiling-and-testing-toolkit/usability-checklist.html>, Guía para Desarrollo de Sitios Web del Gobierno de Chile: http://www.guiadigital.gob.cl/guiaweb_old/, Usability Guidelines del MIT: <http://web.archive.org/web/20110511060055/http://ist.mit.edu/services/consulting/usability/guidelines>,

Directrices para sitios web del Estado Colombiano: <http://www.mariocarvajal.com/archivos/Directrices-de-usabilidad-para-sitios-web-del-Estado-en-Colombia.pdf>, Iniciativa UsabAIPO: <http://aipo.es/articulos/4/16.pdf>

Table 1. Comparison of existing Guidelines

Guidelines	Text Appearance	Headlines and Titles	Find Content	Multimedia	Organization Content	Design Interfaces
HHS Guidelines	✓	✓	✓	✓	✓	✓
Directrices de Userfocus	✓	✓	✓	✗	✓	✓
Nielsen Norman Group Guidelines	✓	✓	✓	✗	✗	✓
Swedish National Guidelines for Public Sector Websites	✓	✓	✓	✓	✓	✓
SIRIUS	✓	✓	✗	✓	✓	✓
Australia Government Usability Checklist	✓	✓	✓	✗	✓	✓
Guía para Desarrollo de Sitios Web del Gobierno de Chile	✗	✗	✗	✗	✓	✓
Usability Guidelines del MIT	✓	✓	✓	✗	✓	✓
Directrices para sitios web del Estado colombiano	✓	✓	✓	✗	✓	✓
Iniciativa UsabAIPO	✗	✗	✓	✓	✓	✓

To design the structure of the heuristic test, we have taken into account the structure that handles the Integrated Web Usability Assessment Process in the Model Driven Software Development (WUEP), which was built by Adrián Fernández (2009). That is, the heuristic test is classified by sections in which the attributes to be evaluated are presented with their respective description or meaning and as an additional data an example is shown for each attribute.

The User-Oriented Web Usability Assessment System, based on the Determination of Critical Tasks, called SIRIUS was built by María del Carmen Suárez in 2011, which determines the results in a quantitative way and expresses it in percentages. Therefore, in the heuristic test the results of the evaluation are calculated in a quantitative way and expressed in 100, using certain criteria used by the SIRIUS application in its formula to determine its results. It has been considered convenient, to present the results also in qualitative form based on the quantitative calculations that the test performs.

In order to determine the final quantitative result of the evaluation, a formula (1) that calculates the total of the values assigned by the evaluators or experts to the evaluation attributes is elaborated, since to evaluate the usability in a quantitative way there is no particular method that is official.

$$\text{Level}_{\text{STRUCTURE AND WRITING}} = \frac{\sum (\text{Values})}{(\sum_{\text{MAX}}^{\text{N}^{\circ} \text{ATTRIBUTES}} \times \text{Value})} \times 100$$

Donde:

- \sum (Values) It is the sum of all values of the attributes that have been evaluated.
- $\sum N^{\circ}$ ATTRIBUTES It is the sum of the number of attributes.
- Value MAX It is the maximum value of the attributes = 3.

In the qualitative result it has been considered to distribute in three to the number 100 because the quantitative answer will be expressed in 100. Therefore, three terms will be used to qualify the final value of the result, which are: Bad, Fair and Good. Table 2 shows the conditions that have been taken into account to determine the distribution of the qualitative results according to the value obtained.

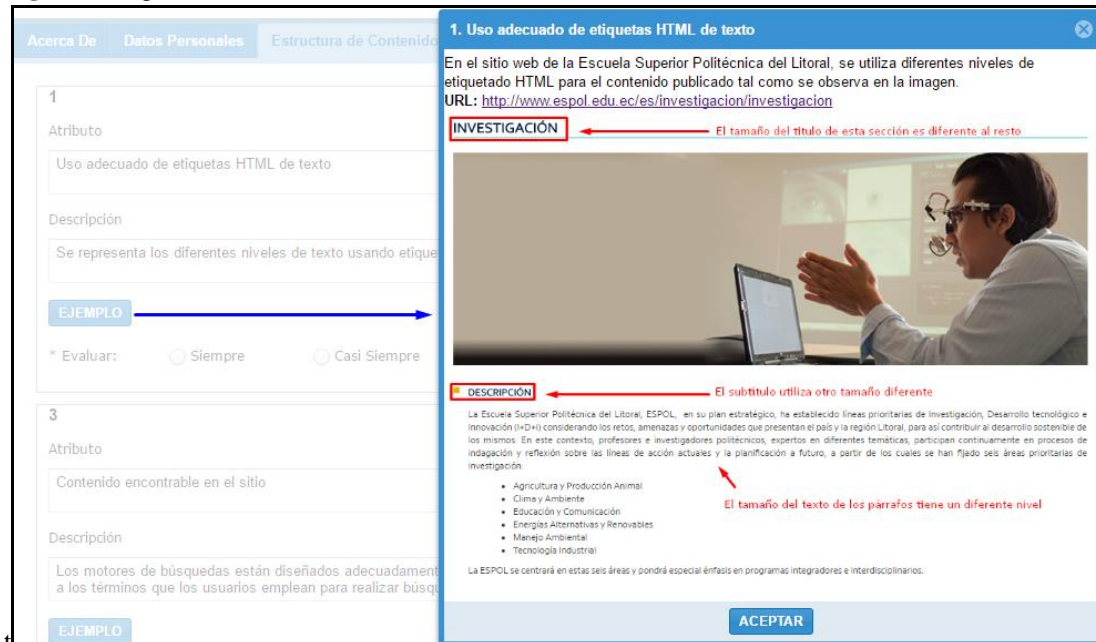
Table 2. Distribution of the qualitative values of the test

Condition / Value	Result
≤ 33	Bad
$> 33 \leq 67$	Regular
> 67	Good

The qualitative and quantitative calculations will be applied to three sections: content structure, content writing and graphic design, ie partial results will be obtained. The graphic design section will be expressed under two terms: Good and Bad, because in this section only two attributes are evaluated.

Each attribute, regardless of the section in which it is located, will have its corresponding description and example, so that the evaluator can properly interpret the terms of the analysis of the evaluation of the websites, as shown in Figure 1.

Figure 1. Organization of the attributes in the te



As shown in Figure 2, the test provides the evaluator with three types of responses according to the importance of the attributes and will be evaluated on a scale from 0 to 3, where 0 is the lowest and 3 is the highest. If the answer is Not applicable, the attribute will not be taken into account for the determination of the calculations.

Figure 2. Types of responses used in the test

<p>19</p> <p>Atributo</p> <p>Uso de imágenes con etiquetas clickable.</p> <p>Descripción</p> <p>Presenta etiquetas con hipervínculo en las imágenes que se pueden hacer clic sobre ellas para redireccionar a otro lado.</p> <p>EJEMPLO</p> <p>* Evaluar: <input type="radio"/> Sí <input type="radio"/> No <input type="radio"/> No Aplica</p>	<p>20</p> <p>Atributo</p> <p>Uso de video, animación y audio, con significado</p> <p>Descripción</p> <p>Muestra video, animación y/o audio solo para ayudar a transmitir el mensaje de una página web.</p> <p>EJEMPLO</p> <p>* Evaluar: <input type="radio"/> Sí <input type="radio"/> No <input type="radio"/> No Aplica</p>
<p>21</p> <p>Atributo</p> <p>Uso de logotipo de forma consistente</p> <p>Descripción</p> <p>Presenta el logotipo de la organización en un lugar consistente, en todas las páginas del sitio web.</p> <p>EJEMPLO</p> <p>* Evaluar: <input type="radio"/> Sí <input type="radio"/> No</p>	<p>22</p> <p>Atributo</p> <p>Uso separado entre el banner y los elementos de contenidos</p> <p>Descripción</p> <p>No presenta elementos de contenido cerca o dentro del banner que puedan causar confusión al usuario.</p> <p>EJEMPLO</p> <p>* Evaluar: <input type="radio"/> Siempre <input type="radio"/> Casi Siempre <input type="radio"/> Poco <input type="radio"/> Nunca</p>

After evaluating each of the sections, a new tab called Summary is enabled, here the data entered, the answers assigned to the attributes, the partial results by section are presented qualitatively and quantitatively and the overall result. The Summary tab can be edited if necessary, it also has a button that is responsible for saving all the data and submit a report with the information previously named, so the evaluator remains with evidence of the results obtained from their evaluation and this report the site administrator can apply the appropriate changes to your website.

For the construction of the website where the heuristic test is hosted, the following technical aspects have been taken into account:

- Programming Languages: On the Zend Framework server side 1 and on the client side Ext JS 4 Framework.
- Database: PostgreSQL.
- Report generator: iReport 3.7.1.
- Web server: Apache.
- Operating System: Windows 8.1.

RESULTS

The research resulted in the Web application called Heuristic Test of Structure and Drafting of web content hosted at http://gicoweb.utmachala.edu.ec:8081/test_usabilidad/public/aplicacion/evaluar, based on evaluation attributes of the guidelines set forth in Table 1 of this article. The test can be used by any organization, institution, company or researchers to measure the quality of the structure and writing of the information published on the websites. Based on the results of the test, the necessary corrective measures may be taken to improve the structure and writing of such information.

The heuristic test of structure and content writing of websites is classified into four sections: personal data, content structure, content writing and graphic design.

In the Personal Data section, you enter the personal information of the evaluator and specify the website to be analyzed. The other sections are formed by a list of 43 attributes represented in Table 3, which details its description and the characteristic to which it belongs.

Table 3. List of test attributes

No.	Attribute	Description	Characteristic	Section
1	Proper use of html tags (hypertext markup language) in the text	Presents different levels of text using HTML tags according to their hierarchy	Content Organization	Structure of Contents
2	Avoid broken links	Links with invalid routes or nonexistent paths	Find Content	
3	Findable content	Search engines are appropriately designed to present content according to the user's need	Find Content	
4	Organized information	The information is organized in all sections of the site and shows a clear and logical structure	Content Organization	
5	Consistency of information needed	Information is available and presented when needed	Find Content	
6	Related information groups	The information must be grouped according to its functionality and differentiated from the rest	Content Organization	
7	Reduced click usage	Tasks must be completed in as few clicks as possible (maximum 3)	Content Organization	
8	Presents quantitative content	Proper use of tables, graphs and visualization techniques for a better understanding of the information.	Content Organization	
9	Displays required information	Pages display necessary information without overlapping other information	Content Organization	
10	Using colors for grouping content	Identify each section with a specific color that allows to differentiate the different groups of contents	Find Content	
11	Publish information for multiple audiences	It presents information according to the type of user that visits the site	Content Organization	
12	The home page reflects the main idea of the site	The home page provides the main contents that the site covers in a summarized way	Content Organization	
13	Useful content	The published content is related to	Content Organization	

		the needs of users who visit the system		
14	Provides descriptive tab titles in each section	Presents a descriptive, unique and concise tab title for each page	Headlines and Titles	
15	Using descriptive and unique headers	It shows descriptive and unique headings, that is to say the title expresses of general form the content that presents that section and it differs from the rest of headings	Headlines and Titles	
16	Using Descriptive Titles for Rows and Columns	Present table of data with clear and concise titles in both rows and columns	Headlines and Titles	
17	Use of simple funds	Uses background images in moderation and simple, especially if they are behind the text	Interfaces Design	
18	Using images with clickable tags.	Presents hyperlinked tags to clickable images to redirect elsewhere	Find Content	
19	Use of video, animation and audio with meaning	Shows video, animation and / or audio only to help convey the message of a web page.	Multimedia	
20	Consistent use of logo	Present the organization's logo in a consistent place on all pages of the website	Content Organization	
21	Separate use between the banner and the content elements	It does not present elements of content near or inside the banner that can cause confusion to the user	Content Organization	
22	Avoid large images in the important content section	It does not fill the entire important content section of the page with an image. Taking into account that at the bottom there may be more information	Content Organization	
23	Ensure images relate to content	The images are representative with respect to the content they belong to	Multimedia	
24	Limited use of images	Use images only when they are critical to website success	Multimedia	
25	Using pictures to	Present images in place of text	Multimedia	

	facilitate learning	wherever possible to facilitate learning		
26	Obvious and consistent sequence actions	The step sequences you use to perform an action are orderly, easy to understand, and are maintained throughout the process	Content Organization	Content Writing
27	Avoid slang	No terms are used that any user has difficulty understanding or interpreting	Find Content	
28	Use of dictionary or glossary of terms	Contains a section that allows you to visualize the meaning of terms unknown to the user	Find Content	
29	Avoid non-defined abbreviations in the system	Abbreviations are unknown or are not defined in the system	Find Content	
30	Limit of words and sentences	The sentences have a maximum of twenty words and the maximum paragraph six sentences	Content Organization	
31	Avoid excessive prose text	The lack of prose text allows navigational elements to occupy a central place in navigation pages	Content Organization	
32	Active voice usage	Writing of sentences in active voice and not in passive	Content Organization	
33	Easy-to-understand language	The language used is aimed at any type of user	Content Organization	
34	Using lists	Use lists (ordered, without order and definitions) as appropriate to avoid paragraphs in prose when necessary	Content Organization	
35	Use of content writing technique	The text uses web content writing techniques such as: Inverted Pyramid, Self-similar, Transparent Layers, or any other	Content Organization	
36	Using plain text with black background	The text is black and the background is flat	Text Appearance	
37	Consists of text formatting consistently	The format of the text remains in any section of the website	Text Appearance	
38	Mixed case use for prose text	Use italic, bold, lowercase, or uppercase text when necessary to	Content Organization	

		facilitate quick reading to users		
39	Font size usage, minimum 12 pts	Presents 12 point font type (minimum value) on all pages or sections of the website	Text Appearance	
40	Emphasize important text	Shows a change in the font when emphasizing an important word or short phrase in the text	Text Appearance	
41	Using highlighted text	Highlight highlighted information with up to two different forms on a single page	Text Appearance	
42	Friendly interface	It presents an interface with uniform colors in most of the pages and that match the image offered by the institution.	Interfaces Design	Design Graphic
43	Clean Interface	It shows an interface without visual noise and with a correct use of space.	Interfaces Design	

Source: Self made.

CONCLUSIONS

Undoubtedly, usability is one of the parameters that help improve the quality of websites since it considers the user experience. Usability derives some considerations, including structure and content writing, which in many cases are not taken into account by quality assessment software.

This research provides a different type of evaluation with an emphasis on the content of websites, based on the experience of the expert users when browsing these sites.

Being online and free access is expected to be used by the entire community interested in evaluating the quality of websites and to contribute to obtain effective, efficient and satisfactory sites.

REFERENCES

- Alcántara-Pilar, J. M., & del Barrio-García, S. (2016). El papel moderador del diseño web y la cultura del país en la respuesta del consumidor online. Una aplicación a los destinos turísticos. *European Research on Management and Business Economics*, 22(2), 78–87.
- Alonso, J. (2008). El sitio web como unidad básica de información y comunicación. *Información y Comunicación IC*(5), 226-247.
- Baeza-Yates, R., Rivera-Loaiza, C., & Velasco-Mertín, J. (2004). Arquitectura de la información y usabilidad en la web. *El Profesional de la Información*, 13(3), 168-178.
- Benigni, G., & Zabala, S. (2015). Diseño de interfaces en los medios visitados por los venezolanos ¿Los más usados son usables? *Question*, 1(48), 263-280.
- Carrión, S., Padilla, A. (2014). Usabilidad web: Pensando en el bienestar del usuario *Revista Tecnológica ESPOL-RTE*, 27(2),67-78.
- Carreras, O. (22 de Marzo de 2012). *Usable y Accesible*. Obtenido de Usable y Accesible: <https://olgacarreras.blogspot.com.es/2012/03/web-usability-guidelinesdirectrices-de.html>
- Fernández-Cavia, J., Díaz-Luque, P., Huertas, A., Rovira, C., Pedraza-Jiménez, R., Sicilia, M., Míguez, M. (2013). Marcas de destino y evaluación de sitios web: una metodología de investigación. *Revista Latina de Comunicación Social*(68), 622-638.

- Gervasi, O; Pallottelli, S; Ordaz, J A; Benigni, G; (2011). USABILIDAD ÁGIL Y REINGENIERÍA DE SITIOS WEB: USABAGLE Web. *SABER Revista Multidisciplinaria del Consejo de Investigación de la Universidad de Oriente*, 23(1) 51-61. Recuperado de <http://www.redalyc.org/articulo.oa?id=427739445009>
- Gonzalez, O. (2013). El índice cuantitativo de calidad web como instrumento objetivo de medición de la calidad de sitios web corporativos. *Investigaciones Europeas de Dirección y Economía de la Empresa*, 19 (1), 16-30. Recuperado de <http://www.sciencedirect.com/science/article/pii/S1135252312000342>
- Gutierrez, C. (2008). Diseño web y arquitectura de información para sitios 2.0, *Cuadernos de Información*, 22, 58-65.
- Hilera González, J. R., Fernández Sanz, L., & Suárez Morón, E. (2012). Evaluación de la legibilidad de webs de universidades. *El Profesional de la Información*, 21(5), 468-474.
- López-Andrada, C. (2016). El lector como usuario: implicaciones didácticas. *ISL*, 6(6), 36-50.
- Maniega-Legarda, D. (2006). Aplicación de criterios de usabilidad en sitios web : consejos y pautas para una correcta interpretación, *Observatorio TIC : REBIUN Red de Bibliotecas Universitarias*. Retrieved from <http://eprints.rclis.org/8476/>
- Mesquita Sales, O. M., & Bentes Pinto, V. (2016). Arquitetura da Informação: estudo e análise da base de dados Public Medical (PubMed). *Biblios*(63), 12.
- Mordecki, D. (2010). Arquitectura de información para sitios de gran porte, *El profesional de la Información*, 19(4), 368-373.
- Mordecki, D. (2012). *Guía práctica de Usabilidad web miro y entiendo*. Montevideo: CONCRETA.
- Moyano, A., Gaetán, G., & Martín, A. (2016). Interface Móvil para el Sitio Web de la UACO. *Informe Científico Técnico UNPA*, 8(1), 172-201.
- Nielsen, J., (1999). Designing web usability: the practice of simplicity, New Riders Publishing, Indianapolis.
- Oliván, S. (2001). ¿Evaluar la calidad de los recursos Web o simplemente filtrarlos? *Documentación de las Ciencias de la Información*, 24(24), 105-126.
- Paz Enrique, L. E., & Cuellar Santos Suárez, L. L. (2016). Diseño de la arquitectura de información del sitio web de la Facultad de Ingeniería Industrial y Turismo de la Universidad Central "Marta Abreu" de Las Villas (Cuba). *Cuadernos de Documentación Multimedia*, 27(2), 125-140.
- Pérez Montoro, M. (2010). Arquitectura de la información en entornos web. *El Profesional de la Información*, 19(4), 333-337.
- Pérez, M., Pérez, R., León, S., Maninat, M., Triana, J. (2010). Moscaweb contenidos - instrumento para la evaluación de contenidos académicos provenientes de internet, *Revista de la Facultad de Ingeniería U.C.V.*, 25(3), 87-98.
- Prefasi, S., Magal, T., Garde, F., & Giménez, J. L. (2010). Tecnologías de la Información y de la Comunicación orientadas a la educación de personas con discapacidad cognitiva. *Revista Latinoamericana de Tecnología Educativa*, 9(2), 107-123.
- Rodríguez López, J. (2011). La contracción digital del presente. *El Profesional de la Información*, 20(2), 219-227.
- Rodríguez, L., González, D., & Pérez, Y. (2017). De la arquitectura de información a la experiencia de usuario: Su interrelación en el desarrollo de software de la Universidad de las Ciencias Informáticas. *e-Ciencias de la Información*, 7(1), 23.
- Serrano, E. (2009). Accesibilidad vs usabilidad web: evaluación y correlación, *Investigación Bibliotecológica*, 23(48), 61-103.
- Suárez Torrente, M. d. (2011). Sistema de Evaluación de la Usabilidad Web Orientado al Usuario y basado en la Determinación de Tareas Críticas. Oviedo, Asturias, España.
- Tárano León, S. (2007). La Arquitectura de la Información en entornos virtuales ¿Sabemos escribir para la web? *Revista de Arquitectura e Ingeniería*, 1(1), 7.
- Vielba, I. R., & Clemente, N. C. (2008). Calidad de las sedes web de las OTRI universitarias andaluzas: contenidos, usabilidad y accesibilidad, *Revista española de Documentación Científica*, 31(3), 366–395.

How Can Students Contribute to Their Own Learning with Ict: The Opportunities and Challenges with 1:1 Tablets in Education

Serpil TUTİ SARI

Vice Principal

TED İzmir College

TURKEY

serpil.tutisari@tedizmir.k12.tr

ABSTRACT

This study is on the implementation of ICT, especially using tablets and electronic white boards at different disciplines and its consequent school-wide effects and overall transformation at Turkey Pilot Schools. In this article, we will talk about tablet activities that we designed and explain how we utilize these activities with the learning outcomes of other disciplines by collaborating with the faculty at K-12 level. While we are constructing ICT curriculum and designing our activities, we consider 21st century skills, ISTE standards, students' needs at the individual level, as well as the school culture.

INTRODUCTION

In 21st century (Dede, 2009; Spires, H., Bartlett, M., Garry, A., & Quick, A., 2012) and beyond, developed and developing countries need highly qualified individuals. The schools, teachers, education leaders, policy makers and companies devote serious effort to integrate technology into curricula to harvest such highly qualified individuals. Therefore, the education systems, learning and teaching tools and materials, teaching and learning methods need to transform in order to reach contemporary education. We can easily see that every new technologies based on computers have a transformational effect on education. Even if the results are not good every time, technology integration in education seems essential for 21st century learner profile.

Several research studies show that one-to-one learning technologies have a positive impact on learning and teaching (Bebell & O'Dwyer, 2010; Penuel, 2006; Sclater, Sicoly, Abrami, & Wade, 2006). The most motivating and appealing aspect of using one-to-one tablets or laptop or any other mobile technologies is to have access required information at any time any where via internet (Bebell & Kay, 2010). Moreover, the students can create their own class notes by using different software. Therefore information should be personalized (Spires, H. et al., 2012). As a result, they can learn in a meaningful way and they can archive and organize learning materials and projects in the form of an e-portfolio using their tablets, and share it with the rest of the world. This learning environment also makes teaching easier and change the role of the teachers from the only source of information to guiding, advisor, or coach of lesson (Livingston, 2009). Turkish education policy makers also devote an effort to transform education to prepare the individuals for digital age.

THE STUDY: Observations from the Pilot Schools and Interviews

Even though the pilot projects is very new and it is so early to deduce conclusive results, we want to support students, teachers, and principals in the pilot schools in meetings in orders to provide pedagogical perspective. We discussed general opinions, concerns and expectations in our meetings. Some of the opinions of the teachers, vice principals, students were as follows:

I. LDC Smart Board and Tablet usage in 1-to -1

LCD Smart board has good effects to teaching but it is not user friendly. The design of the LCD smart board (which is integrated with a chalk board and a white board) should change, and area of writing should be expanded. There should be white board instead of chalkboard. When USB port is used for memory stick, the LCD Smart Board's computer is locked even if there's no virus in the memory stick. Teachers have to turn the computer off and on again. Teachers and students lose class time because of technical problems. The anti-virus software of the LCD Smart Board's computer should be controlled. LCD Smart Board should be in teacher's control; there may be a password. The students use the LCD Smart Board in the breaks, and as a result, the calibration settings of the boards change. The speed of LCD Smart Boards is not enough, and menus are very slow.

The problems with LCD Smart Board are effected usage of tablets. Teacher cannot control the tablets with their computers. This situation creates huge classroom management problems. There is a need for classroom management software. The teachers cannot lock the tablets when the students take their tablets to “flight mode”. Students play games using tablets during the lessons, they have difficulty concentrating to lessons.

The teachers should be able to create the exam sheets from the tablets; there should be a classroom management system such that students are able to get feedback and their exam results using their tablets. File sending and receiving, e-mail, forums should be allowed between teachers and teachers, students and students, teacher and students. This can also create a positive impact on communication in the school (Spires, Oliver, & Corn, 2011; Lei & Zhao, 2008; Mouza, 2008). Moreover, the students can share and send their homework and project with teachers and other students. Limited Internet connection permits the students and teachers access some web sites, which are official and permitted by MONE. The security issues, limited access to the Internet, and locked video-camera properties de-motivate the students and teachers’ using tablets in education (Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010). During one of our school visits, we made an open survey by asking students “how many of you brought to tablets to school, today?” at one class of ninth grade students. Just three of thirty-four students had brought their tablets to the school. Interestingly and surprisingly this school was one of the top schools in terms of student achievement. One of the students said that they couldn’t do anything with tablets, since there are no office programs, they are not allowed to use Internet, they cannot use any means of communication, and they cannot use video or camera properties. They have electronic version of textbook and they preferred to bring textbook instead of tablets into class. Tablets are expensive, the students does not want to take the responsibility of tablets. As a result of this, development of e- content is also one of the most important issues in the pilot project.

II. E-Content Issues in 1-to-1

The tablets have basic software for basic operations such as note taking and e-book reading. The expectations of students and teachers are more than e-books and r-books, more than scanned (or electronic) version of the textbooks. E-content should be enriched: with animations, tests, maps, interactive applications, and interactive test and exam questions. R-books should be available in teachers’ tablets, too. There should be office software to use word processing, spreadsheets and presentations to create projects or other activities. Internet usage area should be expanded (research tools, dictionaries, wikis, etc.), and it should be in teacher’s control. There is a need for information and communication teacher and technology technician support in every school. Teachers need more and hands-on training for technology integration to their teaching in their subject area. During the interviews, the teachers from the different subjects (e.g., math, science, history, geography, foreign language, etc.) indicate that they need training specialized in their subject to integrate tablet into classroom activities.

III. Teachers’ Points of View about Tablets in Education in 1-to-1

LCD Smart Board usage is more efficient compared to tablet usage. However, e-content is limited especially for tablets. Teachers’ general view is that tablets are unnecessary. Ministry of National Education gave the first training but it was not sufficient and sustainable. Although they feel unconfident on how to integrate tablets to their courses, they want training on its usage first. The software, the scanned version of the schoolbooks, and e-content in the tablets are not sufficient for integrate into education. The teachers are unhappy and worried about the fast change. The students’ achievement is found to decrease while the teachers and students are striving to integrate tablets to their learning and integration to the courses. Teachers’ another general feeling is pressure about they should constantly use the tablets and the LCD Smart Board. They wonder if the technology is the aim or tool. From that point, I can say that the vision and mission of one-to-one tablet project haven’t been combined, yet in Turkey based on the pilot project.

FINDINGS and CONCLUSIONS

Education leaders, principals, teachers, and students should be made aware of the meaning, impact, opportunities of one-to-one tablet project for teaching and learning. The teachers and policy makers should think and create teaching and learning activities beyond the classroom. Tablets and similar kinds of mobile technologies provide teachers, learner or anybody who want to learn whenever, wherever, they want. They should listen to a lesson podcast when they you are in a bus, work on their homework in a café house, create a biology video in a botanic garden, or a history presentation on museum visit, have an interview with people on the street about smoking, create an e-portfolio for the class notes and projects, have an exam online and take the quick feedback. The teachers should guide the students with such activities. Otherwise, using tablets or any other technologies will not create much impact on learning and will not motivate the teachers and students. Technology is not a magic tool to readily provide activities; the teachers should create curriculum activities, design learning scenarios by using information and communication technologies.

There are many components to create a one-to-one tablet environment in education. In the future, the pilot projects will be in a much larger scale. It is important to know the obstacles and problems about the project for the further studies and advancement. One-to-one tablet project in education is not one time trial and should be made sustainable (Livingston, 2009). It is necessary to update the software, train the teachers, and develop the curriculum in the education faculties for the teachers' readiness and training in order to achieve goals for the 21st century.

REFERENCES

- Bebell, D., & Kay, R. (2010). One to One Computing: A Summary of the Quantitative Results from the Berkshire Wireless Learning Initiative. *The Journal of Technology, Learning and Assessment*, 9(2). Retrieved from <http://ejournals.bc.edu/ojs/index.php/jtla/article/view/1607>
- Bebell, D., & O'Dwyer, L. (2010). Educational Outcomes and Research from 1:1 Computing Settings. *The Journal of Technology, Learning and Assessment*, 9(1). Retrieved from <http://ejournals.bc.edu/ojs/index.php/jtla/article/view/1606>
- Dede, C. (2009). Comparing frameworks for 21st century skills. In *21st Century Skills: Rethinking How Students Learn* (pp. 51–76). Bloomington, IN: Solution Tree Press.
- Drayton, B., Falk, J. K., Stroud, R., Hobbs, K., & Hammerman, J. (2010). After Installation: Ubiquitous Computing and High School Science in Three Experienced, High-Technology Schools. *The Journal of Technology, Learning and Assessment*, 9(3). Retrieved from <http://ejournals.bc.edu/ojs/index.php/jtla/article/view/1608>
- Lei, J., & Zhao, Y. (2008). One-to-One Computing: What Does It Bring to Schools? *Journal of Educational Computing Research*, 39(2), 97–122.
- Livingston, P. (2009). *1-to-1 Learning, Second Edition: Laptop Programs That Work* (2nd ed.). International Society For Technology In Education.
- MEB. (2012). FATİH: Towards the Education of Information Age. Fatih Projesi Web Sayfasi - Yenilik Ve Egitim Teknolojileri Genel Mudurlugu. Official. Retrieved December 20, 2012, from <http://fatihprojesi.meb.gov.tr/tr/icerikincele.php?id=12>
- Mouza, C. (2008). Learning with Laptops: Implementation and Outcomes in an Urban, Under-Privileged School. *Journal of Research on Technology in Education*, 40(4), 447–472.
- Penuel, W. R. (2006). Implementation and Effects of One-to-One Computing Initiatives: A Research Synthesis. *Journal of Research on Technology in Education*, 38(3), 329–348.
- Sclater, J., Sicoly, F., Abrami, P., & Wade, C. A. (2006). Ubiquitous technology integration in Canadian public schools: Year one study. *Canadian Journal of Learning and Technology / La revue canadienne de l'apprentissage et de la technologie*, 32(1). Retrieved from <http://cjlts.csj.ualberta.ca/index.php/cjlt/article/view/80>
- Spires, H. A., Oliver, K., & Corn, J. (2011). The New Learning Ecology of One-to-One Computing Environments: Preparing Teachers for Shifting Dynamics and Relationships. *Journal of Digital Learning in Teacher Education*, 28(2), 63–72.
- Spires, H., Bartlett, M., Garry, A., & Quick, A. (2012). *Digital Literacies and Learning: Designing a Path Forward*. Friday Institute White Paper Series. NC State University: Raleigh, NC. Retrieved from https://www.fi.ncsu.edu/assets/podcast_episodes/white-paper-series/digital-literacies-and-learning.pdf

See more at:
<http://www.serpiltuti.com/blog/-the-opportunities-and-challenges-with-11-tablets-in-education#sthash.Mh8M5e.dpuf>

How Does Explaining Content Through Videos Benefit Language Learners? Esp Students Tell us About it.

Sandy T. SOTO

*ELT Innovators Research Group
Universidad Técnica de Machala, Ecuador
<http://orcid.org/0000-0003-2314-654X>
stsoto@utmachala.edu.ec*

Ligia Fernanda ESPINOSA

*ELT Innovators Research Group
IKIAM Regional University, Ecuador
ligia.espinosa@ikiam.edu.ec*

Estefanía VARGAS CAICEDO

*ELT Innovators Research Group
Universidad de Guayaquil, Ecuador
vargasnestefania@gmail.com*

Maricela CAJAMARCA ILLESCAS

*ELT Innovators Research Group
Universidad Nacional de Educación – UNAE, Ecuador
cajamarcam1@gmail.com*

Tomás FONTAINES-RUIZ

*Universidad Técnica de Machala, Ecuador
tfontaines@utmachala.edu.ec
Venezuela*

David CARRERA

*Unidad Educativa Particular Bilingüe
"Principito & Marcel Laniado de Wind"
divad_see@yahoo.com
Ecuador*

ABSTRACT

This work aims at analyzing English for Specific Purposes students' perspectives towards the recording of videos as a mean to explain class content. Seventy-five students took part in the study. They recorded one video per week for over ten weeks. Those students who had recorded at least six videos were considered for the study. The participants completed a questionnaire that was composed of twenty-six Likert Scale items. In the questionnaire, students reported their level of agreement on the items. The data was analyzed by conducting a factorial analysis of main components with a Varimax rotation system. Participants' perceptions were grouped in four factors which explain 63, 68% of the variance. The resulting factors show that by explaining content through videos the participants' motivation and academic achievement have improved. The participants have developed personal self-regulated strategies, self-awareness of their learning progress, and environmental self-regulated strategies, indicating, from their perspectives, a positive impact of the strategy in their language learning progress.

Keywords: ESP students, videos, motivation, self-regulation, students' perspectives, self-awareness, academic achievement.

INTRODUCTION

Society is changing and so is education. Nowadays, technology is an important part of people's lives no matter the age. That is why the use of technology is also expanding rapidly in the educational field across schools, colleges, and universities (Pachler, Bachmair & Cook, 2010). Technology has opened up many opportunities for innovative and rich methodologies that allow teachers to do both, motivate students and improve their learning. Today, there are several technology tools that are being used for classroom activities and homework assignments that have proved to be very successful, such as videos or blogs (Riel & Becker, 2008). Used wisely, these tools can become excellent resources for students to engage in creative and meaningful learning practices, and to demonstrate their knowledge and understanding inside and outside the classroom.

Videos in EFL Classes

Traditionally, teachers of EFL (English as a Foreign Language) classes use videos in their lessons to exemplify the use of grammar or vocabulary, to expose students to authentic pronunciation in English, to develop students' listening skills, or simply, to make the class more interactive and interesting. However, this tool allows students not only to collect information but also to be sources and creators of information for others. For example, students can record videos to demonstrate their understanding of class content, to improve their speaking skills, and to receive feedback from teachers and peers (Alwehaibi, 2015). This tool could even become a meaningful, engaging, and authentic medium for EFL students to communicate in English.

Benefits for EFL Learners

Literature review, as well as action research studies, show that videos are tools that facilitate language learning. According to Brook (2011), they increase student participation in speaking activities, builds students' confidence in using the target language, and enables authentic learning. Similarly, Watkins & Wilkins (2011) mention that using videos inside and outside the classroom can contribute to improve students' speaking and pronunciation skills and promote authentic vocabulary development. Finally, other authors suggest that this tool allows learners to connect the content learned in class (grammar and vocabulary) to their personal experiences, using the language learned, in this case, English (Mangubhai, 2005; Wang, 2005). Therefore, in educational settings, it can be a new and dynamic non-traditional teaching and learning asset.

Language production (e.g. speaking) is an important part of the language acquisition process. That is why using tools like video-making could help students to improve their English skills since it encourages them to speak and experiment with the language learned (Chartrand, 2012). In fact, there are several studies that show the benefits that learners can obtain when using videos for academic purposes in EFL courses. For example, in a study conducted with college students, Hazzard (2006) discovered that the creation and posting of videos assisted students in the improvement of their English language skills. Actually, the author reported that after doing this activity, 82% of her students said they preferred making a video and posting it rather than taking a traditional test - even though much more time and effort was required to create the video - because they could see the benefits that this tool brought to their learning process.

Another study conducted with twenty-four students in a foreign language classroom of Russia showed that video-making projects enhance the pedagogical effectiveness of language teaching. The author, Larisa Nikitina (2010), explains that this project allowed students to think, debate, and act using the foreign language. Additionally, videos can promote learning autonomy, which makes students independent lifelong learners who take responsibility for their educational process and do not rely solely on teachers or classroom instruction. In a study conducted by Bramhall, Radley, and Metcalf (2008), it was observed that the creation of videos based on class content, helped students to become autonomous learners who developed a deep understanding of the subject taught. Therefore, through video-making, students can become active agents rather than passive spectators of the learning process, which contributed to improving their language skills.

Now, what if students make videos explaining the information learned in their ESP/EFL classes each week? How could explaining class content through videos benefit language learning? That is exactly what this study intends to analyze. In this paper, ESP students' perceptions towards the recording of videos as a mean to explain class content are analyzed in order to learn about their opinions towards this activity in regards to the benefits they may obtain from it. Therefore, from students' views, this study introduces a different perspective of video-making in EFL/ESP instruction that needs to be explored.

METHODOLOGY

Setting, Participants, and intervention process

The study was conducted at a government-funded university in Ecuador, during the first academic semester (May-September) of the 2017-2018 school year. We worked with 75 out of 94 students enrolled in the Technical English I (46 students) and Technical English II (29 students) courses offered in the Business Management major. 44 were female and 31 were male. The participants' average age was 22.2, ranging from 20 to 30 years old. The students participated in the study voluntarily.

As the outcome of their autonomous work, the participants developed one video per week for over ten weeks, between May and part of July 2017. In the videos, they recorded themselves explaining the content they had studied in class in the previous week as if they were developing a tutorial or an oral presentation. They described key concepts and illustrated them with examples. The key vocabulary was defined as well. For this study, we decided to work with those students who had developed at least six videos up to when the data was collected.

Data collection and Instrument

Data were collected at the end of July 2017. A structured questionnaire was developed to obtain students' perspectives towards the recording of videos as a mean to explain class content. The questionnaire was administered via Google forms and contained two parts. The first part contained questions of demographic information (age and gender); and, the second part was made up of a twenty-six Likert Scale items. In this part, students reported their level of agreement (*strongly agree* (4), *agree* (3), *disagree* (2), and *strongly disagree* (1)) on the items to determine their opinions towards video-making as a mean to explain class content. The instrument was validated by two external researchers who revised it and reported the effectiveness of each item. Redundant items were removed and others restated.

Ethical considerations

Following ethical protocols, informed consent was taken from the participants. Participants identity was protected by having them fill out the data collection instrument anonymously.

Data analysis procedure

A factorial analysis of main factors with a Varimax rotation system was performed. The IBM statistical software SPSS 22.0 was used for performing the analysis.

RESULTS

The factorial analysis grouped the participants' perceptions into four factors that explain the 63,68% of the variance associated with the construct of the study (see Table 1).

Table 1: Total Variance Explained

Factor	Rotation Sums of squared loadings		
	Total	% of variance	Cumulative %
1	5,922	22,777	22,777
2	4,034	15,515	38,292
3	3,722	14,315	52,607
4	2,879	11,073	63,679
Extraction Method: Principal Axis Factoring.			

Table 2: Exploratory Factor Analysis Solution

Items	FACTOR	FACTOR	FACTOR	FACTOR
	1	2	3	4
24. Has increased my willingness of participating in the English class.	,799			
22. Has enhanced my English language learning experience.	,745			
25. Has provided me with more confidence when speaking in English.	,720			
17. Has increased my vocabulary.	,710			
23. Has increased my interest in learning English.	,705			
21. Has helped me to understand the content studied in class better.	,691			
16. Has improved my performance in oral presentations in English.	,649			
26. Has helped me to achieve higher marks in the English class.	,641			
1. Has prompted me to be more attentive in class.	,504			
6. Has induced me to plan my performance in the video.		,727		
8. Has induced me to rehearse what I am going to explain in the video.		,724		
7. Has induced me to organize my ideas to explain a topic in English better.		,662		
4. Has prompted me to identify key ideas of the content studied in class.		,607		
10. Has prompted me to evaluate my English learning progress.		,607		
9. Has induced me to monitor my performance while I make the video.		,537		
3. Has prompted me to review the content studied in class meticulously.		,534		
5. Has induced me to investigate about the topics studied in class in sources other than the ones provided in class.		,533		
11. Has helped me to become self-aware of my ability to speak English.			,850	
20. Has developed my listening skills.			,733	
14. Has improved my pronunciation.			,629	
13. Has prompted me to search for resources and tools to develop my language skills.			,589	
15. Has given me more fluency when speaking English.			,583	
18. Has prompted me to write in English.				,699
12. Has prompted me to look for the help of more knowledgeable peers/outsideers to improve my performance in the task.				,689
19. Has prompted me to read content in English.				,656
2. Has prompted me to take notes about what is being explained in the class.				,374

The results of the factorial analysis show that by recording weekly videos to explain the content covered in their ESP classes, the participants obtained benefits in four areas (See Table 2) which are related to motivation and academic achievement, development of personal self-regulated strategies, self-awareness of their learning progress, and development of environmental self-regulated strategies.

The first area represents the 22,78% of the variance. This factor is composed of 9 items which are linked to the benefits that the participants obtained in terms of motivation and academic achievement. The nine items denote that by explaining the content learned in their ESP class through videos, students' willingness of participating in class and their interest in learning English increased, allowing an enhancement in their learning experience as well as the development of their confidence when speaking in English. The vocabulary repertoire of students also expanded as students developed the videos. Similarly, the development of videos prompted students' attentiveness in class and contributed to a better understanding of the content, resulting in students' achievement of higher marks.

The second factor represents the 15,52% of the variance. It is constituted of 8 items that imply students' development of personal self-regulated strategies. The participation of students in video-making for content explanation induced them to plan, rehearse, organize, monitor, and investigate about what they would present in the videos. The personal self-regulated strategies that students developed prompted them to review the content studied in class and self-evaluate their learning progress as well.

The third factor deals with the development of students' self-awareness of their learning progress. This factor explains 14,32% of the variance and is composed of 5 items. The items indicate that due to their participation in weekly videos, students developed a sense of self-awareness of their learning progress as they became conscious of the improvement in their listening skills, pronunciation, and speaking fluency. This factor also implies that students became open to searching for resources and tools to develop their language skills.

Finally, the fourth factor, which represents the 11,07% of the variance, is composed of 4 items. These items cope with students' development of environmental self-regulated strategies. The development of this sort of strategies means that students got inspired to write and read in English, take notes during class, as well as to ask for the help of more knowledgeable peers to enhance their performance in the videos.

Undoubtedly, giving students the possibility of explaining the content delivered in class through weekly videos, enables them to demonstrate what they have grasped in those academic encounters and develop their speaking skills as it is asserted by Almewehaibi (2015). One of the main benefits that language learners get, considering the estimation of the factorial analysis, is the increase in their motivation and improvement of their academic achievement. The development of the task encourages students to be attentive in class, contributing to a better comprehension of the content delivered, better results in their performance and consequently, an improved academic achievement. In addition, students expand their vocabulary as they must certainly look for linguistic resources to perform the explanations in the videos.

Chartrand (2012) states that video-making allows students to practice the language learned. As in any oral task, the more one practices, the more confident one feels and the better the outcome. This indicates that because of regular video-making (which implies continuous practice of the language), students tend to feel more motivated and confident to participate and speak in English during class, enhancing their learning experience. This confirms the assertion of Brook (2011) who indicated that videos builds students' confidence in using the target language and increase their participation in speaking tasks.

In their study, Bramhall, Radley, and Metcalf (2008) reported that the development of videos based on class content encourages students' autonomy. In this sense, the factorial analysis also demonstrated that as a result of their work on the weekly videos, students built personal and environmental self-regulated strategies (Maftoon & Tasnimi, 2014) which have a close connection with learning autonomy. The self-regulation of their learning process constitutes then another benefit that students obtain from this task. Since they have to explain the content in a coherent way to make themselves understood by their audience (the teacher in this case), they have to review/read the material studied in class and investigate/read about the topic to expand their knowledge on it.

In addition, the task itself induces students to take notes during the class as well as plan, write, organize, and rehearse (by themselves) what they are going to say in their explication to get a decent outcome. As time passes, they even develop the capacity of monitoring their performance while recording their work and self-evaluate their learning progress. All these conditions prompt students to take ownership of their learning process, turning them into active and more autonomous learners as suggested by Bramhall, Radley, and Metcalf (2008).

The study conducted by Gholam-Reza & Anahid (2014) showed that there is a significant relationship between students' use of self-regulated learning strategies and the development of their language proficiency. The fact of taking control of their learning process enables students to develop a sense of self-awareness of their learning progress, one of the factors yield by the factorial analysis. They become aware of how much they have assimilated in class and therefore, what needs reinforcement. They also become aware of how much their linguistic skills have improved and seek for means to enhance them if necessary. Asking for help of more knowledgeable peers to enhance their performance in the videos becomes a common practice. It also becomes a sign of learning self-regulation as a result of becoming self-aware of their learning progress.

CONCLUSIONS

This study intended to analyze ESP students' perceptions towards the recording of videos as a means to explain class content to learn about the benefits that they as language learners obtain from it. The analysis of the results leads us to conclude that giving language learners the possibility making videos to explain class content not only enhances their linguistic skills (speaking mainly), which was in first place the purpose of the activity. It also impacts the academic, cognitive, and social aspects that interfere with language learning.

Linguistically, students experience an evident and quick enhancement in their language learning making them feel motivated and driven to learn. Academically, students achieve higher scores because the activity requires that the learner becomes more committed to his learning process, in addition to the increase in their motivation. Therefore, putting into practice self-regulatory strategies that bring up their cognitive abilities. Similarly, learners' social skills are also enhanced as students seek the help of more knowledgeable peers to develop the task, enabling them to build connections and a sense of bond among them.

As can be seen, explaining content through videos has a positive impact on language learning in a variety of aspects, becoming a powerful tool for EFL/ESP classes. It encourages learners to take ownership of their learning process and induces them to become autonomous. Foreign language teachers should consider implementing this strategy in their instruction, adjusting it according to the needs of their students.

REFERENCES

- Alwehaibi, H. (2015). The impact of using YouTube in EFL classroom on enhancing EFL students' content learning. *Journal of College Teaching & Learning*, 12(2), 121-126.
- Bramhall, M., Radley, K., & Metcalf, J. (2008) Users as producers: Students using video to develop learner autonomy. *International Symposium in Engineering Education*. Loughborough, UK: Loughborough University EngCETL.
- Brook, J. (2011). The affordances of YouTube for language learning and teaching. *Hawaii Pacific University TESOL Working Paper Series*, 9(2), 37-56.
- Chartrand, R. (2012). Social networking for language learners: Creating meaningful output with Web 2.0 tools. *Knowledge Management & E-Learning: An International Journal*, 4(1), 97-101.

- Gholam-Reza, A., & Anahid, H. (2014). Using self-regulated strategies in enhancing language proficiency with a focus on reading comprehension. *English Language Teaching*, 7(6), 160-167.
- Hazzard, D. (2006). Motivating ESL/EFL students to use English through movie making. *The Internet TESL Journal*, 12(12). Retrieved from: <http://iteslj.org/Techniques/Hazzard-MakingMovies.html>
- Maftoon, P. & Tasnimi, M. (2014). Using self-regulation to enhance EFL learners' reading comprehension. *Journal of Language Teaching and Research*, 5(4), 844-855.
- Mangubhai, F. (2005). What can EFL teachers learn from immersion language teaching? *Asian EFL Journal*, 7(4), 203-212.
- Nikitina, L. (2010). Video-making in the foreign language classroom: Applying principles of constructivist pedagogy. *Electronic Journal of Foreign Language Teaching*, 7(1), 21-31.
- Pachler, N., Cook, J., & Bachmair, B. (2010). Appropriation of mobile cultural resources for learning. *International Journal of Mobile and Blended Learning*, 2(1), 1-21. Retrieved from: <http://eprints.uwe.ac.uk/17507>
- Riel M., & Becker H. (2008). Characteristics of teacher leaders for information and communication technology. In J. Voogt & G. Knezek (Eds.), *International Handbook of Information Technology in Primary and Secondary Education* (397-417). Boston, MA: Springer.
- Wang, L. (2005). The advantages of using technology in second language education: Technology integration in foreign language teaching demonstrates the shift from a behavioral to a constructivist learning approach. *THE Journal*, 32(10), 39-42.
- Watkins, J., & Wilkins, M. (2011). Using YouTube in the EFL classroom. *Language Education in Asia*, 2(1), 113-119.

Impact of Online Homework on Students' Performance and Work Habits in Chemical Education

Samir EL HAJJAJI

*School of Science and Engineering,
Al Akhawayn University, Ifrane,
53000, Morocco*

Abdelkrim OUARDAOUI

*School of Science and Engineering,
Al Akhawayn University, Ifrane,
53000, Morocco
a.ouardaoui@aui.ma*

ABSTRACT

This study examines comparatively the effect of online homework on undergraduate engineering students taking a General Chemistry I course. Two different pools of students taught by two experienced instructors were independently surveyed: one which took classic homework that could be downloaded as a pdf document and the other which took online homework. The feedback of each group was collected through online survey questionnaires administered at the end of the semester in order to assess the impact as well as the advantages and disadvantages of each type of homework, based exclusively on students' perspective. Interestingly, our findings show that not all students are necessarily appealed by online homework and that online homework can impact students' motivation. The effect of the homework type (i.e. classic vs online) on other aspects such as the place, the time and the platform used to do the homework was also analyzed and discussed. The study concludes with recommendations addressed to stakeholders of the Chemical Education community.

INTRODUCTION

In an increasingly internet-driven world, educators of the higher education community need to regularly adapt to modern pedagogical tools in order to keep pace with their students' rapidly changing learning style and work habits. One such tool is online homework. This paper is concerned with the effect of online homework administered on a population of University undergraduate engineering students taking a General Chemistry I course. Impacts of online homework on class productivity,¹ students' motivation,² students' understanding,³ student learning⁴ and other aspects⁵⁻⁷ have been reported in the literature. The focus of our own study however is twofold: impact on students' performance and impact on students' work habits. In previous reports, we proved that one of the essential keys to students' success is students' motivation, especially when they study a course that is outside of their major like in our case. Indeed, first Ouardaoui *et al.* tackled the problem of students' lack of motivation either by taking either a field study approach with non-Science University students⁸ or by integrating ICT with middle school pupils.⁹⁻¹⁰ Later, El Hajjaji *et al.*¹¹ successfully solved the same problem by taking a hands-on approach by devising a lab experiment dealing with difficult concepts covered in the classroom. In this report, we propose this time to affect positively students' motivation, and student's performance in general, by considering yet another parameter: the homework type. The serendipitous observation that our students performed noticeably better in their General Chemistry I course final exam when their instructor switched their homework type from a classic pen-and-pencil based system to a modern web-based system was the initial rationale to consider this parameter. This starting point encouraged us to investigate further this phenomenon by leading a comparative study between a group of students taking classic paper-based homework versus a group taking the online version of that homework. These two groups were taught the same course, during the same semester, by two experienced instructors. Students were then surveyed to collect their feedback and to draw conclusions.

THE STUDY

The incipience of this study occurred in Fall 2013, when we decided for the first time, for pedagogical reasons, to administer in our course online homework instead of paper-based homework. Both homework types were provided to students electronically as a set of 40 multiple choice questions in each assignment. In both cases, homework was sent to students once a chapter was completely covered in class, along with its correction and slides of the corresponding chapter. On the one hand, "paper-based" homework should be understood as a printable pdf file containing the homework which is made available to students once uploaded by the instructor on the portal of the University Learning Management System. Once downloaded by the student, the latter is free to print it or not, knowing that this homework is not graded and therefore not due. On the other hand, "online

homework” should be understood as a comprehensive html webpage containing an html version of the homework, as well as links to various printable pdf files, namely the homework itself, its correction, the slides of the chapter associated to that homework, the course syllabus and the periodic table of the elements. Html files were created by Pearson test generator 7.4 and subsequently edited for customization via Macromedia Dreamweaver 8. Finally, they were uploaded on the instructor’s website via ftp with WS_FTP. An example of homework assignment created with this method is shown in **Figure 1**.

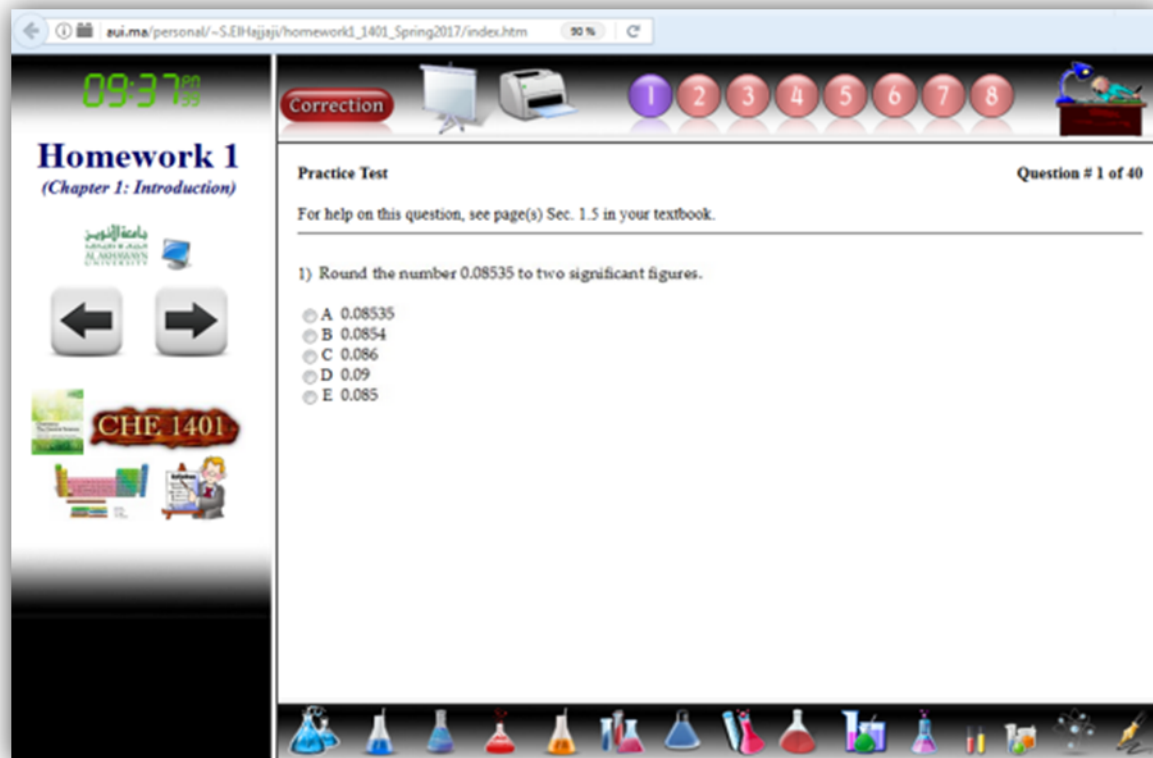


Figure 1: Screenshot of homework 1 in the General Chemistry I course.

In order to assess quantitatively the perception of the two types of homework (paper-based vs online) on our students, an online survey questionnaire was conducted at the end of the Spring 2017 semester.¹⁰ Two distinct groups of students of similar size (25-30) were surveyed; one that took paper-based homework, the other online homework. The response rate was 100% in each case. **Table 1** summarizes the exact conditions of this survey.

	Instructor 1	Instructor 2
Homework type	^(a) Paper-based	^(b) Online
Homework assignments	8 (320 questions)	8 (320 questions)
# of students enrolled	30	25
# of respondents	30	25

(a) Homework posted on the University LMS portal as a printable pdf document.

(b) Homework posted on the instructor’s website as an html webpage.

Table 1: Conditions of the online survey questionnaire submitted to students taking the General Chemistry I course in Spring 2017.

In this survey, students were asked a total of 8 questions which are listed in **Table 2** below. Two sets of questions can be distinguished; questions Q1-Q4 deal with students’ perceptions of the homework type, while questions Q5-Q8 provide insight on students’ work habits which may be affected by the homework type. Note that questions Q1a and Q1b were given to students who had taken the paper-based homework and online homework respectively.

Reference	Measurement	Suggested answers
Q1a	I wish my homework was online instead of being posted on the portal as a pdf document only:	<ul style="list-style-type: none"> ❖ Strongly agree ❖ Agree ❖ Disagree ❖ Strongly disagree ❖ No comments
Q1b	I am glad my homework was online instead of being posted on the portal as a pdf document only:	
Q2	Overall, I was satisfied by the quality of the homework assignments this semester	
Q3	If you prefer the online version of the homework over the simple pdf version, please indicate why:	
	• Q3a It is user friendly	
	• Q3b It is intuitive	
	• Q3c It is clear	
	• Q3d It tells me if my answer is correct right away	
	• Q3e It increases my motivation to do the homework	
	• Q3f Other reason(s)	
Q4	If you prefer the simple pdf version of the homework over the full online version, please indicate why	<i>open-ended question</i>
Q5	How do you usually do your homework?	<ul style="list-style-type: none"> ❖ Always ❖ Very often ❖ Often ❖ Sometimes ❖ Rarely ❖ Never
	• Q5a On paper, by printing it first	
	• Q5b On paper, without printing	
	• Q5c Without paper, I just read and answer questions on the screen	
Q6	When do you usually do your homework?	
	• Q6a In the morning	
	• Q6b In the afternoon	
	• Q6c In the evening	
	• Q6d Late at night	
	• Q6e Monday through Friday	
	• Q6f Saturday	
	• Q6g Sunday	
Q7	Where do you usually do your homework?	
	• Q7a In the University computer lab	
	• Q7b In the library	
	• Q7c In my dorm room, on a desk	
	• Q7d In my dorm room, on my bed	
	• Q7e At home, on a desk	
	• Q7f At home, on my bed	
	• Q7g In transportation: car, taxi, bus, train	
	• Q7h In cafés	
	• Q7i Outdoor, on campus	
	• Q7j Outdoor, outside campus	
Q8	From where do you usually do your homework?	
	• Q8a From a University desktop computer	
	• Q8b From my own laptop	
	• Q8c From my smart phone	

Table 2: Questions asked to students who participated to the online survey questionnaire in Spring 2017.

FINDINGS

Table 3 shows the course final exam grades obtained by students when taught the General Chemistry I course by

the same instructor, in two different semesters, Fall 2009 and Fall 2013.

		Fall 2009	Fall 2013
Homework type		Paper-based ^(a)	Online ^(b)
Students enrolled		49	36
Homework assignments		8 (320 questions)	8 (320 questions)
Course final exam grade	A	2%	22%
	B	43%	28%
	C	29%	31%
	D	20%	8%
	F	6%	11%

(c) Homework posted on the University LMS portal as a printable pdf document.

(d) Homework posted on the instructor's website as an html webpage.

Table 3: Results obtained by students when taking paper-based and online homework in the General Chemistry I course.

Surprisingly, the proportion of students who got a passing grade (A,B,C) in the course final exam increased from 73% to 81% when switching to online homework, a significant increase. The increase in the A grade is the most noteworthy, starting as low as 2% and ending as high as 22%. As for the proportion of students getting a failing grade (D,F), it fell from 26% to only 19%. These figures clearly indicate that the homework type does have an impact on the students' academic achievement, online homework being seemingly more beneficial than the paper-based one.

The next step was to conduct an online survey questionnaire to a pool of 55 students in Spring 2017. Results of this survey are shown in **Tables 4-7**.

In **Table 4**, **entries 1-2** indicate that 96% of students, regardless of the homework type they took, stated to have a preference for online homework over the paper-based one. The reason of this preference is given in **entries 5-14**, in which the majority of students have answered that they prefer online homework because:

- it is user-friendly (**entries 5-6**)
- it is intuitive (**entries 7-8**)
- it is clear (**entries 9-10**)
- it tells them if the answer is correct right away (**entries 11-12**)
- it increases their motivation to do the homework (**entries 13-14**)

Note that for each of the factors above, the total proportion of students answering "agree" and "strongly agree" is always greater for students who took the online homework rather than the paper-based one.

Regarding student's satisfaction of the quality of their homework (**entries 3-4**), a substantial gap is observed between the answers given by students taking online homework and those taking the paper-based one. Indeed, 96% of the students taking online homework responded to be satisfied, while this number is only 54% with the other group. Undoubtedly, these answers are directly correlated to **entries 1-2**.

Entry	Measurement	Type of respondent	Results				
			Strongly Agree	Agree	Disagree	Strongly disagree	No comment
1	Q1a	P ^(a)	43%	53%	3%	0%	0%
2	Q1b	O ^(b)	48%	48%	4%	0%	0%
3	Q2	P	27%	27%	37%	7%	3%
4		O	72%	24%	0%	0%	4%
5	Q3a	P	8%	56%	4%	12%	20%
6		O	56%	40%	0%	0%	4%
7	Q3b	P	16%	48%	8%	8%	20%
8		O	44%	40%	4%	0%	12%
9	Q3c	P	15%	54%	4%	8%	19%
10		O	64%	32%	4%	0%	0%
11	Q3d	P	40%	40%	0%	4%	16%
12		O	72%	28%	0%	0%	0%
13	Q3e	P	36%	32%	4%	8%	20%
14		O	52%	44%	4%	0%	0%

(a) P: answer given by students who took paper-based homework

(b) O: answer given by students who took online homework

Table 4: Answers received for questions Q1-Q3e of the survey.

In **Table 5**, **entries 1-9**, bring further insight to better understand why is online homework preferred by students. Respondents indicated that the online version of the homework is more practical (**entry 4**), it optimizes time (**entry 5**), it is quick (**entry 6**), it is easily accessible (**entry 7**) and that it indicates as a hint which section of the chapter is relevant to the question (**entries 8-9**). Respondents preferring paper-based homework over the online one justify their choice mainly with the fact that the latter is not always accessible because it requires a proper and reliable internet connection (**entries 10-14**). Other justifications include the perception that online homework is less suitable for group work (**entry 15**), that working with pen and paper is better than working on a computer (**entry 16**), that using a hard copy is more desirable (**entry 18**), or that paper-based homework is clearer, more efficient or more accurate (**entries 19-21**). Interestingly, among students who took online homework, not a single respondent proposed arguments favoring paper-based homework over the online one (**entry 22**).

Entry	Measurement	Type of respondent	Answers
1	Q3f	P ^(a)	<i>Homework assignments in pdf format are sometimes misleading</i>
2			<i>It is easier to check the right answer</i>
3			<i>It is much easier to check our answers</i>
4			<i>More practical, makes me remember the answer more than with the pdf version</i>
5		O ^(b)	<i>It optimizes time</i>
6			<i>It is quick</i>
7			<i>It is easily accessible</i>
8			<i>It indicates the section in which the answer is in the chapter</i>
9			<i>It is mentioned which section of the chapter you will find the type of the exercise</i>
10	Q4	P	<i>I prefer the offline version because the online work is not accessible when there is no internet</i>
11			<i>Sometimes we don't have access to the Internet so the whole file cannot be accessed</i>
12			<i>I prefer the pdf version because sometimes the internet doesn't work so we do not have access to the homework</i>
13			<i>Once you download the pdf file, you will be able to work on it whenever you want as opposed to the online version (especially that the wifi is not strong in some dorm rooms) and we will always have the files on our computers or drives</i>
14			<i>I prefer to have it as a pdf in order to save it in my laptop and access it whenever and wherever I want, also I can easily print it to work on it</i>
15			<i>The online version is good but not enough as the pdf version, because when revising with classmates, and we want to review a specific question, we go to it directly and after a certain time we can see the answer on a different sheet of paper, I think that the online version is not practical at all for a group work which we are encouraged to do during our university career</i>
16			<i>Because you have all the questions available. Maybe if we have access to all the questions (online) and can choose the one you want to try, it would be better</i>
17			<i>It can be printed, and I prefer working with a pen and a paper rather than my computer</i>
18			<i>You can easily print the pdf versions and work on them, I like doing my homework using hard copies instead of the online version</i>
19			<i>Because having the homework in front of you is clearer</i>
20			<i>It is more efficient</i>
21			<i>Because it is more accurate</i>
22		O	<i>no answer</i>

(a) P: answer given by students who took paper-based homework

(b) O: answer given by students who took online homework

Table 5: Answers received for questions Q3f and Q4 of the survey.

Results shown in **Table 6** examine the difference in student's work habits when they are provided with either paper-based or online homework. When asked how they usually do their homework (Q5), students responded very differently depending on the type of homework they were provided with. In **entries 1-2**, 60% of the students who performed the paper-based homework responded to do the latter on paper by printing it first, « always » or « very often ». Comparatively, only 28% of the students who performed online homework gave

that same answer. This trend is inverted however when it comes to do the homework paperless as shown in **entries 3-6**. In **entry 4**, 36% (vs 30%) of students used to take the online homework have declared to do it by using paper without printing it, « always » or « very often ». This figure goes up to 48% (vs 26%) when they are asked if they perform their homework without paper, without printing (**entry 6**). These results clearly show that online homework pushes students to go paperless. When asked when they usually do their homework, students doing online homework seem to do it in the morning and afternoon, more than those taking paper-based homework (**entries 7-10**). The best time of the day though seems to be the evening and the night, for both types of students (**entries 11-14**). As for the best time of the week to do the homework, most students indicated, in order of preference, that they prefer week days, next Saturday, then Sunday (**entries 15-20**).

Entry	Measurement	Type of respondent	Results					
			Always	Very often	Often	Sometimes	Rarely	Never
1	Q5a	P ^(a)	27%	33%	7%	7%	3%	23%
2		O ^(b)	16%	12%	20%	16%	24%	12%
3	Q5b	P	13%	17%	27%	3%	20%	20%
4		O	16%	20%	12%	24%	16%	12%
5	Q5c	P	17%	10%	0%	27%	27%	20%
6		O	24%	24%	12%	16%	8%	16%
7	Q6a	P	3%	13%	10%	3%	27%	43%
8		O	16%	4%	20%	20%	24%	16%
9	Q6b	P	7%	20%	17%	20%	10%	27%
10		O	8%	32%	20%	24%	8%	8%
11	Q6c	P	7%	40%	17%	20%	3%	13%
12		O	16%	32%	12%	28%	12%	0%
13	Q6d	P	17%	23%	20%	10%	20%	10%
14		O	4%	36%	4%	20%	28%	8%
15	Q6e	P	10%	27%	23%	7%	10%	23%
16		O	20%	20%	36%	16%	0%	8%
17	Q6f	P	3%	17%	23%	17%	10%	30%
18		O	0%	20%	8%	40%	16%	16%
19	Q6g	P	17%	17%	17%	20%	30%	0%
20		O	0%	24%	8%	44%	16%	8%

(a) P: answer given by students who took paper-based homework

(b) O: answer given by students who took online homework

Table 6: Answers received for questions Q5 and Q6 of the survey.

In **Table 7**, respondents declare to prefer doing their homework, in order of preference, on the desk of their bedroom, at the University library and at the University computer lab (**entries 1-6**). The vast majority of respondents indicated to dislike the bed of their dorm room, their home, caf  s, transportation and outdoor as places to do their homework (**entries 7-20**). Finally, when asked from where they usually do their homework, students responded, in order of preference, from their laptop, from a University desktop computer and from their smartphone (**entries 21-26**).

Entry	Measurement	Type of respondent	Results					
			Always	Very often	Often	Sometimes	Rarely	Never
1	Q7a	P	7%	20%	23%	13%	10%	27%
2		O	12%	8%	12%	16%	16%	36%
3	Q7b	P	7%	23%	20%	20%	7%	23%
4		O	8%	20%	12%	32%	12%	16%
5	Q7c	P	13%	33%	20%	10%	7%	17%
6		O	24%	8%	16%	20%	12%	20%
7	Q7d	P	10%	13%	10%	13%	23%	30%
8		O	8%	4%	12%	12%	20%	44%
9	Q7e	P	7%	10%	3%	10%	13%	57%
10		O	8%	4%	16%	0%	16%	56%
11	Q7f	P	3%	7%	3%	7%	3%	77%
12		O	0%	4%	8%	4%	12%	72%
13	Q7g	P	3%	0%	7%	7%	0%	83%
14		O	0%	0%	4%	4%	4%	88%
15	Q7h	P	0%	7%	0%	10%	0%	83%
16		O	0%	0%	4%	0%	8%	88%
17	Q7i	P	0%	10%	7%	10%	0%	73%
18		O	4%	0%	8%	0%	12%	76%
19	Q7j	P	3%	13%	3%	7%	0%	73%
20		O	4%	0%	4%	0%	8%	84%
21	Q8a	P	3%	23%	23%	13%	13%	23%
22		O	12%	8%	16%	24%	4%	36%
23	Q8b	P	33%	40%	10%	7%	3%	7%
24		O	48%	32%	16%	4%	0%	0%
25	Q8c	P	3%	10%	7%	13%	13%	53%
26		O	4%	4%	8%	8%	24%	52%

Table 7: Answers received for questions Q7 and Q8 of the survey.

CONCLUSION

To conclude, this study has been able to provide evidence that switching from classic paper-based homework to online homework can enable students to perform better academically. When surveyed, the great majority of students expressed their preference for online homework over the paper-based one because it is in their view, user-friendly, intuitive and clear, it provides answers right away and it increases students' motivation. However, though they appreciate it, these students believe that the kind online homework they performed remains perfectible. The major concern attributed to online homework, by students preferring paper-based homework, is the fact that it requires a reliable internet connection. This study has also proved that the homework-type (classic vs online) does affect student's work habits. Students provided with online homework tend to go paperless when performing their homework. Also, our survey showed that most students, regardless of their homework type, prefer to do their homework in the evening or at night during week days, from either their laptop, or from the desk of their dorm room.

Online homework is certainly a great tool that educators, from the Chemical Education field and beyond, should definitely consider adopting in their classes. It is engaging to students, especially in this technological era in which physical digital platforms (computers, tablets, smartphones, etc) have become affordable and widely available.

REFERENCES

- 1 J. R. Dodson, “*The impact of online homework on class productivity*”, *Sci. Educ. Int.*, **2014**, 25 (4), 354-371.
- 2 S.C. Hunter, “*Does Online Homework Increase Motivation to Complete Homework?*”, **2015**, United States Military Academy, http://www.usma.edu/cfe/Literature/Hunter_15.pdf
- 3 K.K. Cheng, B.A. Thacker, R.L. Cardenas, C. Crouch. (2004), «*Using an online homework system enhances students’ learning of physics concepts in an introductory physics course* », *American journal of physics*, **2004**, 27 (11), 1447.
- 4 K. Evans, P. Hummel, “*Assessing the effect of online homework on student learning in a first circuits course*”, 122nd ASEE annual conference and exposition, **2015**. Paper ID #12390.
- 5 J. Dillard-Eggers, T. Wooten, B. Childs, J. Coker, «*Evidence on the effectiveness of online homework*», *College Teaching Methods & Styles Journal*, **2008**, 4 (5), 9-16.
- 6 G. J. Christopher, «*Student perceptions of the impact of web-based homework on course interaction and learning in introductory accounting*», *Issues in Information Systems*, **2008**, 9 (1), 223-232.
- 7 J. A. Johnson, R. McKenzie, «*The effect on student performance of web-based learning and homework in microeconomics*», *Journal of Economics and Economic Education Research*, **2012**, 14 (2), 115-126.
- 8 A. Ouardaoui, A. Legrouri, K. Sendide, A. Metioui, «*Increasing motivation of non-science students for environmental chemistry through field studies*», *Proceedings of the International Conference on Recent Trends in Science Education, Smolenice, Slovakia republic*, 15-17 October **2012**, 20-24.
- 9 A. Ouardaoui, A. Legrouri, H. Darhmaoui, «*Increasing pupils’ motivation and performance through the use of ICT-based education*», *Proceedings of the International Conference on Recent Trends in Science Education, Smolenice, Slovakia republic*, 15-17 October **2012**, 183-188.
- 10 A. Ouardaoui, A. Legrouri, H. Darhmaoui, K. Loudiyi, «*ICT integration into chemistry-physics classes in middle schools through a participatory pilot project approach*», *Procedia - Social and Behavioral Sciences*, **2012**, 55, 232–238.
- 11 S. El Hajjaji, A. Ouardaoui, “*Teaching an undergraduate thermochemistry lab session in a safe and easy way: the bomb calorimetry experiment*”, *The Turkish Online Journal of Educational Technology – Special issue for the INTE 2016 conference*, **2016**, 627-631.
- 12 Survey submitted to students taking paper-based homework: <https://goo.gl/forms/35Y7rkHE5P5DkyuV2>
Survey submitted to students taking online homework: <https://goo.gl/forms/MSAduGH2zdxwgo53>

SUPPLEMENTARY MATERIAL

Supplementary material for this article can be found online at:

www.aui.ma/personal/~S.ElHajjaji/IETCpaperCode415170SuppMaterial.pdf

In-Service Teacher Training Needs Among Basic Education Teachers

Cristie Ann Jaca DELFIN

*Graduate Faculty, Department of Teacher Education
tiandelfin@gmail.com*

Felino B. JAVINES JR.

*University of San Carlos, Cebu City, Philippines
uscbedk12@gmail.com*

ABSTRACT

A teacher engages in professional development program in order to enhance instructional delivery. One dimension of this preparation is the in-service teacher training that schools provide as part of its faculty development plan. This training provides opportunities for teachers to be updated with trends and issues in their discipline at the same time reflect on their teaching practices so they can enhance both their personal and professional characteristics as facilitators of learning. This paper presents the results of the Teacher Training Needs Assessment Survey conducted among the University of San Carlos (USC) Basic Education Teachers based on their In-Service Teacher Training experiences on May 2015. Using the researcher-made survey questionnaire, teachers were asked to rate the five areas being looked into namely: Teaching Learning Activities, Campus Ministry, Guidance, Testing, and Administration. This paper will only highlight the summary results on the five areas of the training. Based on the findings, Teaching Learning Activities was found to be more needed followed by Administration, Guidance, Testing then Campus Ministry. It was noted that there is a need to standardize the teachers' training in order to be relevant and useful for the teachers.

Keywords: In-Service Teacher Training, Professional Development, Teaching Practices, Training Needs, Teaching-Learning Activities

INTRODUCTION

Teacher Training is an important aspect of a school's faculty development plan as it provides opportunities for teachers to upgrade and improve their teaching practices. Teachers bring to formal in-service programs differing attitudes and beliefs born of years of life and work experience, positive and negative, that profoundly affect learning outcomes (Bullough, 2009) and influence the teachers' way of teaching as perceived by their personal experiences (Bollough and Baughman, 1997). The professional life of a teacher is accompanied by a set of expectations such as professional behavior, the ability to communicate, team working, reflecting and learning (Denby, 2012). It is during in-service teacher trainings that teachers reflect on their own teaching practices as that they get to be reminded of this realization. As such, teachers need time to reflect on their teaching practices as these are part of both their personal and professional development that are oftentimes neglected due to magnitude of tasks and deadlines they have to attend to. There is no agreed-on terminology used for in-service professional development programs. "Staff development" and "in-service training" are sometimes used for short-term workshops or short courses that offer teachers information or ideas, often abstract and unrelated to teachers' work (Cochran, Smith & Lytle, 2001). They can be based on the delivery of information by experts to teachers, whose role is largely passive. "Professional development" or "continuing professional development" (CPD) are used for a continuous, career-long program that encompasses more comprehensive teacher learning and relies strongly on more-active forms of learning, sometimes facilitated in workshops but often in teacher groups at the school or cluster level (Villegas-Reimers, 2003). The "newparadigm" of professional development has moved away from short-term teacher-training events where information is transmitted by an expert to a group of attentive listeners to a more constructivist model (Lind, 2007) where she advocates the constructivist model based on the recognition that learning takes place over time and that active learning requires opportunities to link previous knowledge with new understandings (Cochran-Smith & Lytle, 2001 and Uptis, 2005).

Many in-service teacher trainings do not have clearly defined purposes and direction. In some cases, the training becomes a pre-requisite requirement for teachers before they start the school year but no monitoring scheme has been established if what has been taught or learned from the training is being applied to improve classroom teaching. This is a common observation expressed by both teachers and administrators alike. Tyler (2013) in his book *Basic Principles of Curriculum and Instruction* articulated that education is a process of changing the behavior patterns of people. This is using behavior in the broad sense to include thinking and feeling as well as overt action. This when applied to the teachers training, emphasizes the need for a clear articulation of training objectives in order to achieve the desired outcomes. On the other hand, in the book *Models, Strategies and Methods for Effective Teaching* (Lang & Evans, 2006), one of the aspects of teaching is the Professional Development Process. This model called professional development process (PDP) is used to acquire the behaviors and reflection-in-action capability of an effective teacher. In this process, opportunity for continuous professional growth is provided as a personal knowledge about teaching is reconstructed. It focuses on the basic principles and practices of teaching and the development of a strong personal professional self-concept. In this connection, schools conduct in-service training for their teachers as part of the school's annual calendar of activities in order to provide teachers opportunities to improve their teaching practice.

School-based in-service teacher training are common features not only in American and European universities but also Asian universities like in Singapore and Thailand. To mention, School-Based-Training for teachers and administrators was introduced as a means to provide long term and on-going training at reduced cost (Dr. Varakorn Samakoses, Ministry of Education, Thailand). This has been implemented by Ramjitti Institute of Chulalongkorn University and there's also Thailand's Institute for the Promotion of Teaching Science and Technology. High-impact professional learning has three characteristics: 1) a focus on student learning, 2) rigorous measurement of adult decisions, and 3) a focus on people and practices, not programs (Reeves, 2010).

In the Philippines, the term In-Service Teacher Training refers to the school's faculty development program for teachers to be aware familiarize the school's policies at the same time improve their teaching skills. Schools regularly conduct annual in-service training for their teachers in order to improve the quality of teaching and learning process, the quality of students' outputs and outcomes, and the quality of teachers that both relate to their self-efficacy and professional development. With the recent educational reform, the implementation of the Enhanced Basic Education Act of 2013 (K+12 Educational Program), more teachers need in-service trainings to cope with the demands of the new educational system in the country. In fact, 140,000 teachers undergo training for K+12 program last May 7 to June 1, 2012 (Ronda, 2012) <http://www.philstar.com/headlines/807429/140000-teachers-undergo-training-k12-program>. As teachers attend in-service teacher trainings, they bring with them varied classroom experiences that they want to improve or share best practices on what works in their classes. However, not much has been written nor being documented on how the training has helped the teachers in terms of improving their classroom performance and even their personal and personal self-worth as a teacher.

The purpose of a training needs assessment is to identify performance requirements and the knowledge, skills, and abilities needed by an agency's workforce to achieve the requirements. An effective training needs assessment will help direct resources to areas of greatest demand. The assessment should address resources needed to fulfill organizational mission, improve productivity, and provide quality products and services. A needs assessment is the process of identifying the "gap" between performance required and current performance. When a difference exists, it explores the causes and reasons for the gap and methods for closing or eliminating the gap. A complete needs assessment also considers the consequences for ignoring the gaps. <http://www.opm.gov/policy-data-oversight/training-and-development/planning-evaluating/> Training Needs Assessment, March 16, 2015.

The University of San Carlos Basic Education Department provides a regular in-service training to their teachers annually. This training is usually held during summer particularly during the last week on month of May and would even extend to first week of June. This becomes a requirement to all teachers for personal enhancement and professional development in order to prepare them for the start of the new academic year. The training usually takes about two weeks and the topics vary depending on the need of the school and the availability of resources and speakers. The In-Service Teacher Training is one of the means to achieve the school's faculty development plan that provides professional development among teachers. The in-service training for teachers is a basic component in planning for teachers' professional development. Thus, every year schools provide this training for teachers to improve their classroom practice and their professional competence. It is then important to document, monitor, and evaluate the in service training and solicit feedback from the teachers themselves in order to improve the program and respond to their needs. In this connection, this paper presents the teachers' training needs based on the five areas identified in order to provide feedback on how the training can be improved to help develop both the personal and professional efficacy of the teachers will eventually lead to more productive learning outcomes.

MATERIALS AND METHODS

This study employed the qualitative-quantitative, descriptive research design with the purpose of looking into the teachers training needs based on the five identified areas. These are Teaching Learning Activities, Campus Ministry, Guidance, Testing, and Administration. A researcher-made survey questionnaire was used to solicit data on the teachers' in-service training needs that relate to both their personal efficacy and their professional development. This was the In-Service Teacher Training Needs Assessment Tool that was used to collect the needed data. Part one of the questionnaire solicit the respondent's profile based on their personal profile, professional background and teaching experiences. Part two solicited information on the teachers' training needs based on the five areas. They were asked to rate these areas according to which ones are mostly needed in relation to how they can improve their teaching practice. In addition, they were also asked on how relevant the topics were, how useful were the information in terms of classroom application, and how their personal efficacy both as a person and as a teacher were improved during the in-service training conducted.

The data were solicited during the teacher's In-Service Teacher Training conducted on May 2015 in the University of San Carlos, Basic Education Department. There were twenty four male teachers and one hundred twenty female teachers from the three different campuses (Montessori Academy, North Campus and South Campus) where the needed information were collected. These teachers handle subjects from different learning areas.

RESULTS AND DISCUSSION

The relevance of a teachers' training is in its application to classroom practice. In order to determine the significance of the teachers' in service training in the Basic Education Department of the University of San Carlos in Cebu City, Philippines. There were five dimensions of the training program which were rated by teachers based on what is the most needed to the least needed during their training. Table 1 shows the result of the survey on the teachers' in-service training needs.

In-Service Teacher Training Dimensions

There were five identified areas during the in-service teacher training that were looked into namely: These are Teaching Learning Activities, Campus Ministry, Guidance, Testing, and Administration. Teacher-respondents ranked these areas based on what they believed to be important in improving their teaching practice.

Variables	Frequency	Percentage	Rank
Administration	21	14.583	3
Campus Ministry	10	6.944	5
Guidance	33	22.916	2
Teaching Learning Activities	68	47.222	1
Testing	12	8.333	4
Total		144	

Table 1. In-Service Teacher Training Dimensions

Table 1 shows the summary and the corresponding priority needs among USC Basic Education teachers in terms of the most needed to least needed areas for their in-service training. 47.22 % of the teachers indicate Teaching Learning Activities as most needed compared to the other areas. This is attributed to the fact as teachers they want to improve their teaching performance by recognizing what they really need in their classroom teaching to become more efficient and efficient in their classroom tasks. In organizing in service trainings, schools must take into account the teachers' pre-existing teaching practices and find ways on how to improve their instructional delivery. As such, they should ask the teachers on what aspect of their teaching they feel inadequate so needed scaffolding activities can be designed to be incorporated in the in-service teachers' training. Next to teaching Learning Activities is Guidance which is 22.92 % and followed by Administration which is 14.58 %. Teachers have also expressed their need in handling students' behavior in the classroom thus this ranked second on their in-service training needs. This implies that teachers have difficulty managing students in the classroom due to varied personalities and family background where some problematic behaviors surfaced during classroom interactions. Third in the rank is Administration. Teachers expressed some lack of support among some administrators that deprives them of fully delivering the services intended. This is concretely manifested in forms of intrinsic and extrinsic support. It was noted that for Administration, teachers also expressed the need for open communication between the administrators and the faculty in order to ensure that teachers' academic, professional and even personal needs must also be considered when administrators make decisions for it can also affect the teachers' performance and actuations in class. Fourth in rank is Testing which got 8.33% then least is Campus Ministry which is 6.94 %. Testing is also identified as a needed area for this is where the students' previous are validated in relation to their present academic standing. Last on their expressed needs which is close in number with testing is Campus Ministry.

CONCLUSION AND RECOMMENDATIONS

Based on the results of the survey conducted regarding the in service trainings conducted every year, teachers expressed their sentiments on how they can best be helped and supported in their quest to improve their teaching ability that will lead to improve student achievement. In response to the challenges expressed by the teacher-respondents in the study, it was noted that teachers need to undertake a more specific training on their expressed needs that will lead to a more productive and meaningful teaching.

The in-service teacher training is an avenue of realization and provides opportunities for teachers to acknowledge their strengths and weaknesses and provide feedback on how they can enhance both their personal and professional development as a teacher. The experience of having such kind of a training is a way of evaluating and monitoring

what the teachers need in order that they become effective and efficient facilitators in their classes and can help them perform their tasks successfully in school.

REFERENCES

- Blanchard, P. Nick and James W. Thacker. (2014). *Effective training : systems ,strategies, and practices*. 5th Edition: Singapore: Pearson Education South Asia.
- Bruce Joyce and Emily Calhoun (2010) .*Models of professional development : a celebration of educators*. Thousand Oaks, CA :Corwin Press.
- Bullough R.V. (2009) The Continuing Education of Teachers: In-Service Training and Workshops. In: Saha L.J., Dworkin A.G. (eds) *International Handbook of Research on Teachers and Teaching*. Springer International Handbooks of Education, vol 21. Springer, Boston, MA DOIhttps://doi.org/10.1007/978-0-387-73317-3_10 **Publisher Name** Springer, Boston, MA **Print ISBN** 978-0-38773316-6 **Online ISBN** 978-0-387-73317-3
- Cochran-Smith, M., & Lytle, S. (2001). Beyond certainty: Taking an inquiry stance on practice. In A. Lieberman & L. Miller (Eds.), *Teachers caught in the action: Professional development that matters* (pp. 45-58). New York: Teachers College Press. Conway, C. (2003).
- Denby, Neil ed. (2012). *Training to Teach: A Guide for Students*. London: SAGE Publications
- Kauffman,L.(2001).*Characteristics of Emotional And Behavioral Disorders of Children And Youth*.7th ed. Upper Saddle River,NJ: Merrill Prentice Hall
- Hellmut R. Lang and David N. Evans. *Models, Strategies and Methods for Effective Teaching* (2006). Pearson Education Inc., USA
- Lind, Vicki. (2007). High quality professional development: An investigation of the supports for and barriers to professional development in arts education. *International Journal of Education & the Arts*, 8(2) Retrieved [date] from <http://ijea.asu.edu/v8n2/>.
- Pearson, Lesley-Anne (2012). *Developing Through Mentoring and Reflection In Training to Teach: A Guide for Students*. London: SAGE Publications.
- Reeves , Douglas B.(2010). *Professional development into student results*. USA, ASCD
- Rowe, K.J. (2007). Educational effectiveness: The importance of evidence-based teaching practices for the provision of quality teaching and learning standards. In D.M. McInerney, S.V. Etten, & M. Dowson (Eds), *Standards in Education* (pp.59- 92). Charlotte, NC: Information Age Publishing.
- Schunk, Dale H. (2012). *Learning theories: an educational perspective . 6th ed.*, Boston, MA. : Pearson Education. Training Needs Assessment <http://www.opm.gov/policy-data-oversight/training-and-development/planning-evaluating/>, March 16, 2015
- Tyler, Ralph (2013). *Basic principles of curriculum and instruction*.
- Uptis, R. (2005). Experiences of artists and artist-teachers involved in teacher professional development programs. *International Journal of Education & the Arts*, 6 (8), Retrieved on February 10, 2005, from <http://ijea.asu.edu/v6n8/v6n8/>

ABOUT THE AUTHORS

Cristie Ann Jaca Delfin is an Associate Professor of the University of San Carlos in Cebu City Philippines. She is teaches Language and professional education subjects both in the Graduate and Undergraduate Programs of the School of Education of the same university. She has taught high school for two years and has been teaching in the university for twenty years. Moreover, she has already written six books for Basic Education students and one for teachers. She is likewise a National Trainer for Senior High School Teachers under the National Office of Fund Assistance Private Education (FAPE).

Felino B. Javines Jr., DM is a Graduate professor of the University of San Carlos and Cebu Normal University in Cebu City Philippines. He was the former Vice President for Academic Affairs and the Director of the Basic Education Department of the University of San Carlos. He is a Philippine Association of Accrediting Schools,

Colleges and Universities (PAASCU) Accreditor and Fund Assistance Private Education (FAPE) certifier. He is likewise a National Trainer for Senior High School Teachers under the National Office of FAPE. He is currently writing books with Dr. Cristie in the fields of Education and Management.

Integrated Media Utilization for Creative Tourism Promotion in Bangkok Neighboring Area Nonthaburi, Pathum Thani, and Ayutthaya Provinces

Narong SOMPONG

*Department of Educational Technology, Faculty of Education, Kasetsart University
fedunrs@ku.ac.th*

Nattaphon RAMPAI

Department of Educational Technology, Faculty of Education, Kasetsart University

Cherdpong KHEERAJIT

*Department of Agricultural Extension and Communication, Faculty of Agriculture at Kamphaeng Saen,
Kasetsart University*

ABSTRACT

The Integrated Media Utilization for Creative Tourism Promotion in Bangkok Neighboring Area - Nonthaburi, Pathum Thani and Ayutthaya Provinces aims to: 1) investigate behavior and need of integrated media, and to develop creative tourism route of Nonthaburi, Pathum Thani, and Ayutthaya provinces in connection with Bangkok area; 2) develop database and integrated media for creative tourism promotion in Bangkok neighboring area of Nonthaburi, Pathum Thani, and Ayutthaya provinces; and 3) evaluate the database and integrated media.

Data were collected from 5 sample groups including 31 locals of tourist area in each province, 20 scholars and experts in tourism industry and marketing communication, 207 tourists both Thais and foreigners, 20 government officers and private sector workers in tourism businesses, and 20 community leaders and local administration executives in the tourist areas. Research tools include: 1) in-depth interview of the community leaders and local administration executives ; 2) knowledge survey of creative tourism focusing on local wisdom, local tradition and culture, local food, and local tourist activities; 3) behavioral questionnaire of integrated media exposure; 4) integrated media for creative tourism including website, mobile application, video, and print media; 5) media evaluation form for experts; 6) opinion survey of integrated media usage; and 7) reflective opinion survey of public hearing.

Results showed that 51.3 % of the tourists received information on creative tourism via smartphone or tablet. Tourists mostly satisfied with property of the integrated media within overall satisfactory level of “good”, especially on ease of access to the information; 2) three creative tourism routes including Back to the Past by the River, Creative Agriculture, and Dessert and Local Food have been proposed; 3) result from integrated media evaluation from experts indicate a level of media quality as good; and 4) evaluation of the integrated media from tourists indicate an overall satisfactory level of good in which production technique and application of the media are appropriate.

Keywords: integrated media; destination image; creative tourism

INTRODUCTION

Tourism is an importance service industry of Thailand’s economic. It makes the income to the country around 500,000 million baht per year (about 12,000 million USD; Ministry of Tourism & Sports in Thailand, 2014), especially, in the concept of creative tourism applying to the tourism. It makes the empowerment, income distribute and sustainable to community.

Integrated Media for creative tourism promotion in Bangkok Neighboring Area - Nonthaburi, Pathum Thani and Ayutthaya Provinces developed under the concept of Participatory development by community based. The community members had participated in the planning, setting of the objectives, creating and designing, distribution, and evaluation of the media. This process involves collaborative learning between the community members and researchers and specialists. This research can help community members learn how to further manage the knowledge of local wisdom in the lifelong.

THE STUDY

The objectives of this study were: 1) to investigate behavior and need of integrated media, and to develop creative tourism route of Nonthaburi, Pathum Thani, and Ayutthaya provinces in connection with Bangkok area, 2) to develop database and integrated media for promotion of creative tourism in Bangkok neighboring provinces, and 3) to evaluate tourists' usage of database and integrated media for creative tourism of Nonthaburi, Pathum Thani, and Ayutthaya provinces.

The population in this research included group of local people in Nonthaburi, Pathumthani, and Ayutthaya provinces. Ayutthaya was designated as a research center for the provincial group. Sample group consisted of local people in Nonthaburi, Pathum Thani, and Ayutthaya provinces in which the researchers select the sample groups using Multi-stage Sampling listed in the following: 1) simple random sampling consisted of 31 local people from tourist attractions of each province, 2) purposive selection consisted of 20 scholars and experts in tourism industries and market communications, 3) simple random sampling of tourists consisted of Thais and foreigners by using accidental random sampling technique. The sample included 207 tourists within tourism center of each province, 4) purposive selection of 20 officers and operators from government and private organizations that were related to tourism, and 5) purposive selection of 20 community leaders and executives of local government and private organizations that were related to tourism.

The research instruments were: 1) in-depth interview of the community leaders and local administration executives, 2) focus group discussion form of creative tourism focusing on local wisdom, local tradition and culture, local food, and local tourism activities, 3) questionnaire of integrated media exposure for the tourists, 4) Integrated media for creative tourism including Website (www.localcreativetourism.com), mobile application, printed media, and video presentation, 5) media evaluation form for media experts 6) opinion survey of integrated media usage, and 7) Reflective opinion survey of public hearing. Data were analysed by using percentage, mean, and standard deviation (S.D.).

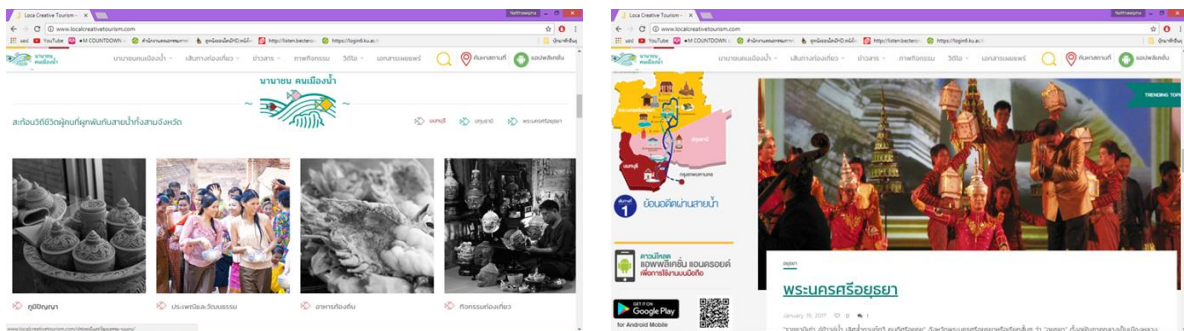
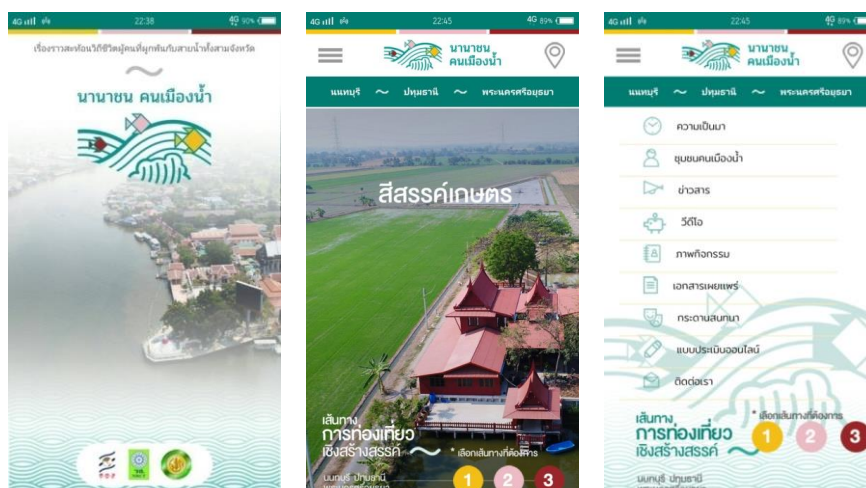


Figure 1 Website URL of the research Project: www.localcreativetourism.com

Figure 2
application
project.



mobile
of the research

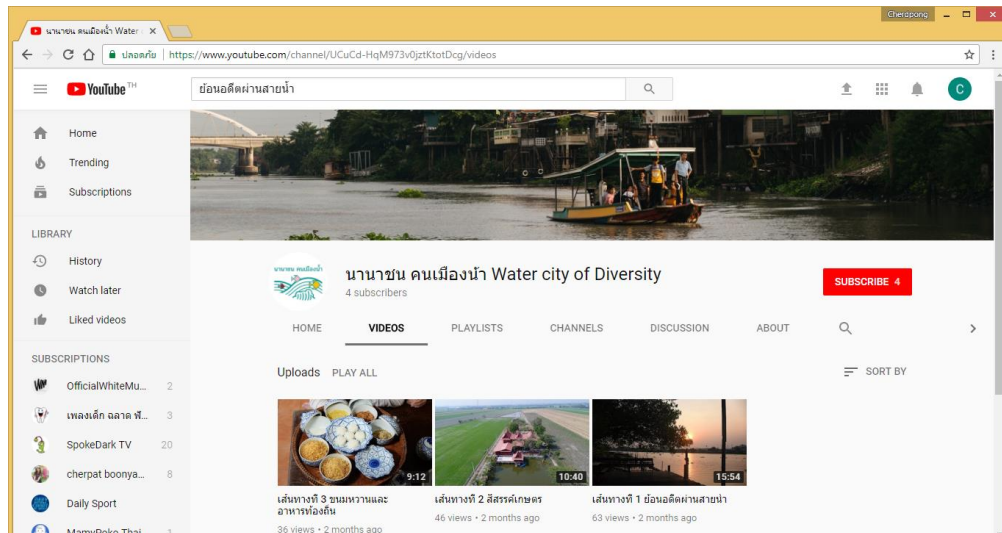


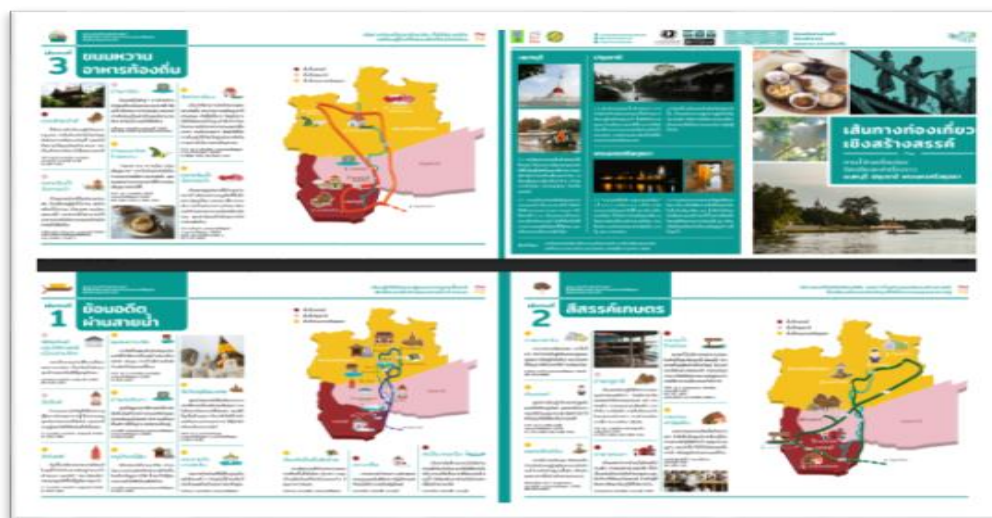
Figure 3 Three video online presentations on the research Website and Application.

Route one: Looking Beyond the River

Route two: Agriculture on Tour

Route three: Colorful Local Food Creatio

Figure 4 Printed media with AR (Augmented Reality) **ZAPPA** code at the top.



FINDINGS

1. The study of integrated media usage for creative tourism show that tourists have opinion on media exposure and usage for travel planning and decision making on an intermediate level. The most usable media for accepting travel news is smartphone with a percentage of 89.3, followed by personal computer (PC; 45.4%) and notebook computer (35.8%), respectively. For frequency of media exposure on travel news, 30.81% of tourists receives travel news less than once a week with 46.9% receives news at 17.00-20.00. Most of the tourists (70.9%) prefers to tell their travel experiences via Facebook, followed Twitter (11.1%) and YouTube (10.7%), respectively. Tourists are very satisfied with property of the integrated media for creative tourism, especially convenience and ease of access to the information.

2. The research has proposed 3 creative travel routes for development of integrated media for creative tourism promotion. The 3 routes are as followed:

Route 1 Looking Beyond the River (2 days 1 night)

Bangkok – Samkhok Historical City Museum – Wat Sing – Wat Bot – Ko Koet community (overnight stay)

Alternative route 1: Baan Hollanda – Japanese Village – Wat Yai Chai Mongkhon (lunch) – Pakkred Pier (Wat Klang Kred) – Ko Kred (Wat Poramaiyikawat) – Bangkok / Alternative route 2: Bang Pa-In Royal Palace + Tonliu Crafts and Arts store (lunch) – Pakkred Pier (Wat Klang Kred) – Ko Kred (Wat Poramaiyikawat) – Bangkok



Figure 5 Route 1 Back to the Past by the River

Route 2 (2 days 1 night)

Bangkok – Wassana Falm – Tan Land – Kong Khong Market (lunch) – Kru Thani House – Ta Cha Yai Sa (overnight stay) + Sai Noi floating market (lunch) – Kratom mushroom farm – Bangkok

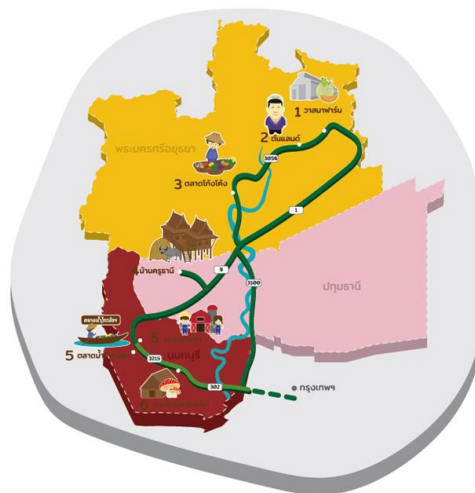


Figure 6 Route 2 Creative Agriculture

Route 3 Dessert and Local Food (2 days 1 night)

Bangkok – The Thai House (lunch) – Wat Sarn Jao Market – Ta Nid House (overnight stay) – Klai Wan Thai Dessert – Wat Tha Ga Rong (lunch) – Agricultural Market – Bangkok

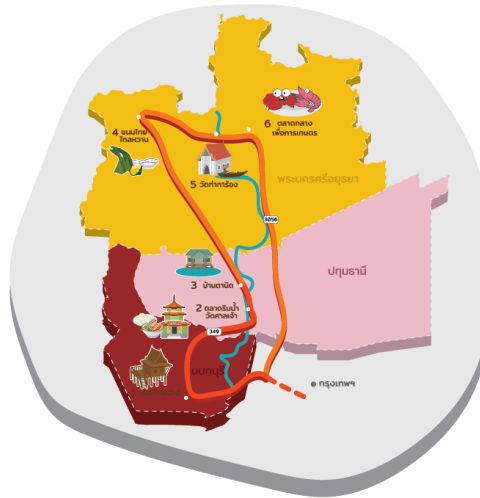


Figure 7 Colorful Local Food Creation

3. Evaluation of integrated media for creative tourism in Nonthaburi, Pathum Thani, and Ayutthaya by media experts shows that the quality level of the media is good in all aspects: knowledge management for tourism and travel route, content, searching system, usefulness and usage, and design.

4. The media usage survey from 207 tourists indicates a good level of the media utilization. Tourists are very satisfied with print media ($\bar{X} = 4.45$), followed by video ($\bar{X} = 4.37$), website ($\bar{X} = 4.29$), and mobile application ($\bar{X} = 4.21$), respectively. Tourists' opinion on usefulness and usage of the integrated media are in a level of very good ($\bar{X} = 4.48$). An ability to promote travel news and research on creative tourism as well as an adaptation of content in the media are the most useful with an equal mean value of 4.50. Other qualities include an ability to be used as searching tools for tourist attraction ($\bar{X} = 4.49$), an ability to interact with the media ($\bar{X} = 4.48$), and an ability to be used as information center which directly serves the users' needs ($\bar{X} = 4.45$).

CONCLUSIONS

The knowledge management process used in the research can be applied in a study of basic knowledge within local community as well as its applications so that definite basic knowledge can be established and stored within the database. Finally, the knowledge management can be used as a template for development of the media under community collaboration. Moreover, the according to the results, development of integrated media for creative tourism performed in this research is a convergent media, which increases communication channel for tourists. As a result, tourists can easily access to the media via multi-channel. In addition, community collaboration has been involved in the development of the integrated media resulting in maximizing a need of the community and tourist. Finally, the integrated media developed in this research together with additional media created from community members will improve the local tourisms as well as build sustainable and continuous tourisms in the area.

REFERENCES

- Atkin Charles K. 1973. Anticipated Communication and Mass Media Information Seeking. New York : Free Press.
- Hunt, Todd, & Ruben, Brent D. 1993. Mass Communication: Producers and Consumers. New York: Harper College Publishers.
- Katz, et al. 1974. The Uses of Mass Communication. New York: Praeger.
- Klapper, J.T. 1960. The Effects of Mass Communication Free Press. New York: Prentice Hall.

- McCombs, M. E., & Becker, L. B. 1979. Using mass communication theory. New Jersey: Print-Hall.
- Ministry of Tourism & Sports in Thailand. 2014. Annual report: office of Ministry of Tourism & Sports department: Author.
- Roger. E.M. and F.FShoemaker. 1971. Communication of Innovations; A Gross Cultural Approach. New York: The Free Press.
- Samuel L. Becker. 1972. Discovering Mass Communication. Illinois: Scott Foresman and Company Glenview.
- Schramm, W. 1973. Channels and Audience in Handbook of Communication. Chicago: Rand McNally College.
- Sprague, G.F.1966. Quantitative genetics in plant improvement, pp. 315-354. In K.J. Frey, ed. Plant Breeding. The Iowa State University Press, Ames, Iowa.

Investigating the Impact of Game-Based Learning on Student Engagement and Performance When Learning About Earthquake Hazards

Jainatul Halida JAIDIN

*Sultan Hassanah Bolkiah Institute of Education
Universiti Brunei Darussalam
halida.jaidin@ubd.edu.bn*

Juraidah MUSA

*Sultan Hassanah Bolkiah Institute of Education
Universiti Brunei Darussalam
juraidah.musa@ubd.edu.bn*

Mohd Redzuan ZAINUDDIN

*Sultan Hassanah Bolkiah Institute of Education
Universiti Brunei Darussalam
reduan_zainudin@gmail.com*

ABSTRACT

We investigate the benefits of game-based learning, in contrast with traditional classroom learning, in terms of motivating and engaging students and improving their information recall and conceptual understanding. We first review game-based activities and learning, focusing on how digital games are motivating, engaging and fun for young people. This suggests that game-based activities could support education by enhancing engagement. We then investigate the use of a game to teach physical geography in the classroom. Seventeen to twenty Year 9 students played a simulation game that involved taking measures to protect a population from earthquake hazards, and receiving scores. The students answered a GCE 'O' Level geography examination question on earthquake countermeasures before and after playing the simulation. Students' answers improved after the simulation, and good performance in the simulation correlated with good answers. Students also reported improved understanding of and engagement in the topic. Finally, we make recommendations for game-based learning.

INTRODUCTION

This study investigates the impact of game-based learning on students' engagement and performance in reducing hazards caused by earthquakes. The study took place in the small country of Brunei Darussalam, wherein teaching and learning are generally described as highly traditional and examination oriented (see, for example, Rashid & Jaidin, 2014; Jaidin, 2009; Burns & Upex, 2002; Azharaini, 1986; Attwood & Bray, 1989). The introduction of a new education system in 2007 was aimed at making significant changes in the ways in which teaching and learning were to be delivered in Brunei. The new education system, called the Education System for the 21st Century (SPN 21), focuses on the development of 21st century skills in lessons across all subject areas, and at the same time, it focuses on strengthening students' content knowledge. SPN 21 highlights the use of information and communication technology (ICT) in teaching and learning. In this way, the introduction of SPN21 has changed the education landscape of teaching and learning in Brunei. The new generation of students in Brunei is no strangers to using technologies in their daily activities. They are the young generation, labeled by Prensky (2001) as *digital native*, who are all *native speakers* of the digital language of computers, video games and the Internet. They are exposed to digital technologies such as tablets on which they play games and pods, search engines such as Google and Bing with which they look for information, and social media platforms such as Facebook and Instagram with which they communicate and socialize.

According to statistical studies (such as the Kaiser Family Foundation and EU Kids Online), playing video games is a common activity of young people when at home. Previous studies on game-based learning suggest that playing video games provide young people with motivation, engagement and fun elements. Therefore, the authors of the present study note the potential of using game-based activities in physical geography lessons to enhance students' engagement in learning. One of the concepts that the second author found typically challenging for students to explain in a GCE 'O' Level geography examination was earthquake hazard. A review of the relevant literature on game-based activities and learning is now presented to provide a contextual background for their use in geography lessons.

VIDEO GAMES AND YOUNG PEOPLE

Playing video games is a popular activity among young people, and are a significant source of entertainment. The popularity of video games began when Atari, a game-based company, released its home video game console called Pong. Video games then evolved from the home video game console to the handheld console with the birth of Nintendo Gameboy. With the help of the Internet, video games can now be played online. With this online gaming, video game companies have designed multi-user domain and multiplayer online role-playing games. Both types of games are capable of supporting large numbers of players at one time, and allow a player to play a game simultaneously with other players from all over the world. Now, the new wave of video games called casual games (Juul, 2010) provides players with more flexible gaming experiences. With the availability of powerful portable technologies combined with the growing bandwidths of mobile networks (Froschauer et al., 2012), casual games can be played on smart phones and tablets. This type of video game has created a *gaming culture* among young people.

Indeed, in today's world, video games have become an integral aspect of students' lives. A survey conducted by the Kaiser Family Foundation (2009) found that, on average, students between the ages of eight and eighteen years spent approximately 90 minutes per day playing video games (cited in Rideout, Foehr, & Roberts, 2010). Additionally, EU Kids Online (2011) conducted a survey in which they asked children which online activities they engage with, and all respondents stated that 'when they begin to use the Internet, the first things to do are schoolwork and playing games' (Livingstone et al., 2011). A recent survey on Teens, Video Games and Civics (2015) found that almost all teens in the study play games. The survey found 97% of teens play computer, web, portable, or console games. The results of these surveys suggest that young people spend their time playing video games. In regards to the popularity of video games among young people, it would be worth exploiting the positive effects of video game, especially in teaching and learning processes.

In the USA, a recent survey entitled *Top Social Media Platforms for Teens (Ages 13 to 17 Years)* and conducted by the Pew Research Centre (2015) found that 71% of the 1060 teenagers who participated in the study are Facebook users, 52% are frequent Instagram users and 33% are Google+ users. It was found that most Internet users are teenagers between the ages of 13 and 17 years. Motivation and engagement are the most commonly cited reasons for considering using video games in teaching and learning (Williamson, 2009; Salen, 2008). It is obvious that video games provide motivational factors, and these factors lead to the engagement of players in playing video games. The appeal of video games is linked to the flow theory of Csikszentmihalyi (1990). Flow theory refers to an experience so gratifying that people are willing to do a task for its own sake, with little concern about what they will get out of it, even when it is difficult or dangerous (Csikszentmihalyi, 1990 p71). According to Pavlas et al. (2012), the elements of flow theory coincide with components of video games that engage players and help them to be fully immersed in the gameplay activities. Such elements are the task to complete, immediate feedback, clear task goals, a balance of skills and challenge, and a sense of control over actions. These elements were also stated by another game scholar, Malone (1986), who argued that students like the idea of initiating and receiving feedback on their online actions, which affects the course of their gameplay. Malone (1986) added that this feature of games provides motivation for students to play.

The gamer receives feedback instantly, allowing them to further explore the gameplay. Such feedback could be in terms of scores, rewards and completed game levels and acts as recognition of the gamer achieving the goal of the game.

Games are also built with clear goals (Dickey, 2005) that lead the player to feel enjoyment when playing the game, with a clear goal allowing a player to change their game play to improve their performance and reach their goal (McClarty et al., 2012). Without goals, players do not know what the objective of the game is or how to complete the task. This is an important element of effective video game design. According to Tamborini and Skalski (2006), the information that the gamer receives often becomes an additional trigger that sustains his or her interest in the game. This interest often develops into ‘an immersion’, which refers to the gamer’s sense of presence or integration within the game (Tamborini & Skalski, 2006). This feature is considered the hallmark of all digital games. It is linked to attainment of the highly pleasurable state of flow during the game play (Kickmeier-Rust & Albert, 2010). With this entire feature, the game has supplied the mind of the student with a new engaging experience, and this engagement may lead to their achievement. The interaction between players and the game is another reason behind the addiction to play games (see for example, Renkl & Atkinson, 2007; Ritterfeld, Shen, Wang, Nocera, & Wong, 2009).

VIDEO GAMES AND ENGAGEMENT

Motivation and engagement are the most commonly cited reasons for considering using video games in teaching and learning (Williamson, 2009; Salen, 2008). It is obvious that video games provide motivational factors, and these factors lead to the engagement of players in playing video games. The appeal of video games is linked to the flow theory of Csikzentmihalyi (1990). Flow theory refers to an experience so gratifying that people are willing to do a task for its own sake, with little concern about what they will get out of it, even when it is difficult or dangerous (Csikzentmihalyi, 1990 p71). Pavlas et al. (2012) note that the elements of flow theory coincide with components of video games that engage players and help them to be fully immersed in the gameplay activities. Such elements are the task to complete, immediate feedback, clear task goals, a balance of skills and challenge, and a sense of control over actions. These elements were also stated by another game scholar, Malone (1986), who argued that students like the idea of initiating and receiving feedback on their online actions, which affects the course of their gameplay. Malone (1986) added that this feature of games provides motivation for students to play. The gamer receives feedback instantly, allowing them to further explore the gameplay. Such feedback could be in terms of scores, rewards and completed game levels and acts as recognition of the gamer achieving the goal of the game. Games are also built with clear goals (Dickey, 2005) that lead the player to feel enjoyment when playing the game, with a clear goal allowing a player to change their game play to improve their performance and reach their goal (McClarty et al., 2012). Without goals, players do not know what the objective of the game is or how to complete the task. This is an important element of effective video game design.

VIDEO GAMES AND LEARNING

There are many indications that video games provide learning experiences to learners. Video-game scholars (e.g., Gee (2003), Prensky (2006), Shaffer (2006) and Squire (2011) have described in detail how video games have positive impacts on teaching and learning. For instance, Gee (2003) provide 36 learning principles of video games, which fall under three categories. These categories are the *empowered learner*, *problem solving* and *understanding*. The term ‘*empowered learner*’ refers to players taking responsibility in designing and creating the virtual world of the video game. ‘*Problem solving*’ refers to players being able to and eager to solve problems in the video game owing to the well-ordered increase in problem complexity. ‘*Understanding*’ refers to players being able to understand the overall concept of the video game through the experience on playing the game (Gee, 2005 p. 4). One example of Gee’s learning principles of video games in the category of *understanding* is players learning to participate in “semiotic domains” made up of signs and symbols, which include digital artifacts of text, images, sound and characters used to create meaning.

Gee (2003) mentions that the term “semiotic domains” is an area or set of activities where people think, act and value in certain ways (p. 19). Players can learn artifacts, words and symbols that have meanings that are specific to a particular set of domains and contexts. However, although the domains are situated in meaning, Gee (2003) argues that they can be a good precursor for learning, because mastering a particular domain facilitates learning in another domain. Another example is being a character, which falls under the category of the empowered learner. Gee (2005) mentioned that the player can become committed to video game characters. The player has the opportunity to take on a new role and experience worlds in which they learn and problem solve (Barab, 2009). The characters might be, for example, scientists, doctors, and chefs, and the player is required to adopt one of the roles and interact with characters playing other roles in the environment. To stay in the game, the player must know what kind of virtual responsibility he or she will take. The better a player can manipulate a character, the more the player invests in the game world. The knowledge creations for such roles are important to young people in terms of their future learning. In playing, a player creates another part of his or her digital identity; e.g., in the case of the character of a prince (Palfrey & Gasser, 2010), the player learns how to behave and live like a prince, even though it is only in a virtual world.

In educational settings, games are typically in the form of experiential exercises that transport learners to another world (Gredler, 2004). The nature of these games provides opportunities for students to apply their knowledge, skills and strategies in achieving the goals of their assigned roles. Gredler (2004) outlined four purposes of educational games: (i) to practice and/or refine already-acquired knowledge and skills; (ii) to identify gaps or weakness in knowledge or skills; (iii) to serve as a summation or review; and (iv) to develop new relationships among concepts and principles.

Prensky (2006) argued that game-based learning is a suitable approach for teaching in the current educational context. In his argument, Prensky (2006) noted that today’s learners have changed. Students have indeed changed radically. Students as a user of the digital technology demand more engaging experiences than just chalk and talk in the classroom. In addition, computer games can provide a new way of motivating students to learn. Motivation is important because learning requires effort. Game-based learning can motivate students because students of digital generations are used to the mechanics of gaming, and to them, the process may feel more like playing than learning without them realizing that they are doing both at the same time. Features of a mainstream recreational game are identical to those of an educational game in some ways. An educational game transports the student to another setting, requires maximum student involvement in learning through an active response, and puts the student in control of the action. In the end, both the recreational game and educational game are games with an objective, which is to win. According to Gredler (2004), to address the features of a game is to analyze the surface structure and deep structure of the game. In brief, the surface structure of the game refers to the observable mechanics of the game and the deep structure refers to the psychological mechanism of the game. Both features are important in transferring students to another setting, they require maximum student involvement through active responding, and they allow the student to control the action (Gredler, 2004).

Educational games most importantly are designed to be a competitive exercise. The objectives are to win through the action of the player. This provides rewards through the player’s own governance using the mechanics of the game and their psychological thinking. In the end, educational games must serve a purpose besides being an exercise. The purpose of game-based learning in the classroom is to increase student interest and provide opportunities for students to apply their understanding of the learned lesson in a new context. The current problem in the field is the lack of well-designed games for different classroom settings.

GAME-BASED LEARNING IN GEOGRAPHY LESSONS

Integrating video games in geography lessons is not a new phenomenon. Squire (2004) mentioned how elements in a game called *Civilization III* can be used to learn concepts found in history and geography lessons. Such concepts were government types (anarchy, despotism, monarchy, communism, republic and democracy) and terrain types (such as grassland, mountains and river valleys). According to Squire (2005), to play *Civilization III* successfully, players must understand each concept and its importance in building an empire. By understanding these concepts, students were able to play *Civilization III* successfully, and at the same time, they learned history and geography lessons. Tüzün et al. (2009) used video games in teaching geography concepts of world continents and countries. Their study focused on how three-dimensional computer games increase students' achievement and motivation. Their findings suggest that computer games can be used to help students in learning about geography, specifically the topic of world continents and countries. They also suggested that the students in their study demonstrated statistically significant higher intrinsic motivations. Depending on the design and quality of graphics, games can be used by educators to capture students' attention and achieve learning outcomes. According to data presented by the Pew Research Centre (2015), most students are also gamers in their spare time, and as such, may find games as a more interesting way to learn concepts that are abstract and complex in certain subject areas such as the sciences, mathematics, history and geography. In the case of Brunei, a majority of the student population can access the Internet via smart phones and gadgets at home and thereby have many opportunities for game-based learning.

THE STUDY

Two research questions framed the course of the present study, namely: (i) *How can game-based learning be used to sustain students' engagement in learning earthquake hazards?* (ii) *To what extent can game-based learning improve students' marks in answering items on earthquake hazards in GCE 'O' Level Physical Examination papers?*

In order to address these research questions, the second author conducted action research in a government secondary school in Brunei Darussalam. Quantitative and qualitative data were collected through pre- and post-tests, as well as focus group interview with the students. A group of seventeen Year 9 students aged between 15 and 16 years old participated in the study.

Traditional pre-test and post-test were used to evaluate the students' understanding of the topic before and after playing an online game created by International Strategy for Disaster (ISDR) in collaboration with a game company called the Player Three. The online game can be found through the following link <http://www.stopdisastersgame.org/en/playgame.html>. It is a simulation-based game where the objectives are to minimize the risk of disasters and save lives. Students can choose different types of disaster to handle. More specifically, the game aims at teaching students how to build safer villages and cities in terms of protecting against disasters. By playing the simulation game, students were able to learn about how certain locations and construction materials of houses can make a difference when disasters strike and how early warning systems, evacuation plans and education can save lives. Students were asked a series of questions on earthquake hazards at the beginning (pre-test) and then again at the completion (post-test) of the lesson. The main purpose in conducting the pre-test and post-test is to measure changes, if any, in the students' knowledge about managing earthquake hazards (Colosi & Dunifon, 2006). The pre-test and post-test were designed using actual GCE 'O' Level Physical Geography examination questions. Both pre-test and post-test focused on managing the impact of a natural disaster, specifically earthquake hazards. Students involved in the study were required to write answers in paragraphs explaining how the impact of natural disasters could be minimized.

In the present study, game-based activities were used as an approach to explore one of the topics taught in Year 9 geography in the Brunei syllabus. Games, aside from being used as entertainment, can potentially be used to trigger interest and sustain students' engagement in a lesson. The current generation of students is as familiar with cell phones, laptops, and iPods as with spiral notebooks and pencils (Mc Hugh, 2006). The use of games and the integration of games with teaching is therefore a new way of encouraging students to be more interested in learning.

The teacher started the lesson by introducing the online game to the students and explaining the goal of the game. The lesson took place in the school's ICT room. Each student was allocated a computer to use throughout the lesson. Students were given the opportunity to ask clarifying questions before they played the simulation game. The teacher also explained that they could ask more questions during the lesson. The students were given ample time to explore the online simulation game. Embedded in the game was the 'level of difficulty' setting that allowed students to control levels of activities that they chose to explore. This particular feature was very helpful to those who were new to the concept of the online simulation game. It also enabled students who were more experienced and advanced to choose more challenging tasks. In so doing, the lesson provided opportunities for differentiated learning. Another interesting feature of the online simulation game is the opportunity to compete with other players from different parts of the world. An important feature of the game is the opportunity to role-play different characters, which requires the implementation of a player's action plans and strategies. The ISDR game was designed using real time strategy (RTS) and thus provided students with opportunities to develop map observation skills and to design a plan of actions to reduce the impact of natural disasters. To play the game, students used a cursor to command and create actions, such as constructing buildings, improving building structures and outlining strategies. Every action that the students used to play the game affected the outcome of the game; i.e. whether they will be able to minimize risks and save lives. Researchers such as Aha, Molineaux and Ponsen (2005) noted that these games are typically characterized by large state space, huge decision space, and asynchronous interactions, and these features make the game interesting to play. Most RTS games are used in a military setting (e.g., Command & Conquer and Warcraft) but there are also RTS games that cater for non-military contexts, such as Civilization and The Sims City. These games using RTS features provide interesting and realistic challenges to students as they learn about risk management relating to natural disasters. In addition, RTS features in games allow students to empathize with and play different characters when trying to solve a real-life problem faced by society. Specifically, the game was designed for students to take the role as town planner. The game is self-explanatory as it provides tutorials, instructions and guides throughout the course of the game. The game lets students choose different types of hazards and different settings of difficulty.

In the study, the students selected an earthquake hazard with an easy level of difficulty. Throughout the game, if the students chose correct strategies, a key fact appears, describing the reasons behind why such strategies would be implemented. This provided students with the knowledge and information that could be used to explain the strategies in a GCE 'O' Level examination for physical geography. The student's role in the game was to plan and construct a safer environment for the population. As the town planner, they were required to assess the hazards and tried to limit the damage when an earthquake strikes. The students tried to protect as many people, buildings and livelihoods as they could against a possible earthquake. They made a choice of housing, upgrades and defenses available to reduce the earthquake hazards. There was also a mission objective in the game that the students were to provide accommodation for 600 people, build a hospital and a school, and retrofit at least 10 old buildings. In addition, the game presented a few challenges. All of the choices for upgrades, housing and defenses required specific funds. The game provided students with a budget of only \$50,000 and allowed them 25 minutes to complete the objective; for example, if the budget was spent before 25 minutes, then the earthquake simulation started earlier than expected.

Students had to choose the best strategies for reducing the earthquake hazards and saved as many people as they could within the funding limit set. Students were challenged to score at least 25,000 points. To keep the activity interesting, the teacher announced that the student achieving the highest score while opening all the key facts was to get a reward. Additionally, scores were recorded during the game and students could attempt to set world-high scores. The students were given two chances to play the game and the game scores were recorded for the purpose of research.

FINDINGS

Findings of the current study are outlined in this section. Results of the pre-test are discussed first, followed by the results of the post-test to illustrate changes that took place in the study, and finally, the students' descriptions about their experiences playing the online game are outlined.

Number of Students	Marks Obtained
7	0
9	1 to 2 marks
2	3 to 4 marks
0	5 to 6 marks
0	7 to 8 marks

Table 1: Pre-Test Results

Table 1 presents the number of students obtaining certain marks in the pre-test. The result of this pre-test is unsatisfactory in terms of the students achieving good marks. The students had already learned the topic before the study was conducted. However, the students had not undergone any game-based learning prior to the study. The pre-test was used to assess the students' understanding of the topic and they were given 10 minutes to answer one question. When marking the pre-test papers, it was noted that the students who obtained zero marks had mostly left the answer space blank. This suggests that the students did not make any attempt to answer the question. Some students made an attempt to describe the conditions that happened after an earthquake incident. Such an attempt, however, was not an answer to the test question, which was to explain ways in which earthquake hazards could be minimized. Some students were also found to have confused the question with a question about volcano hazards, which are different from the hazards caused by earthquakes. Students who obtained marks ranging from one to four provided simple strategies with which to reduce earthquake hazards. An example of their answers is as follows: *[...] do not live near an area that is prone to earthquakes and find a safe place to hide*. It was also found that some students were capable of suggesting good strategies such as *doing earthquake drills by hiding under a table* and *to install a warning alarm system or alert system to alert the population*. Extra marks were given if the students provided more than one strategy and gave full explanations on how the strategies would be successful in reducing or minimizing earthquake hazards.

Number of Students	Marks Obtained
0	0
4	1 to 2 marks
6	3 to 4 marks
5	5 to 6 marks
2	7 to 8 marks

Table 2: Post-Test Results

The post-test was conducted after the students had their second try at playing the game. The students were asked to answer the same one question asked in the pre-test and again given 10 minutes to answer. The post-test results were satisfactory (see Table 2). In the post-test, no one scored zero points. This marks a great improvement compared with the pre-test results. Students who obtained one to two marks gave simple answers taken straight from the game without in-depth explanations to justify their decisions. The students also used random facts that they found in the game without evidence of an in-depth understanding of the content. For example, students simply wrote ‘wooden hut’, ‘town centers’ and ‘hospital’ without further explanation. Another finding of the post-test is the use of themes to outline strategies for minimizing risks. The use of themes to outline strategies was not evident in the pre-test results. Throughout the game, players can unlock key facts, which give them information on why certain strategies are used in a particular area. Students used these key facts to answer the test question. The students also used themes such as ‘education’, ‘buildings’ and ‘warning’ in their answers. They were also able to give more in-depth answers using the information they obtained from the game-based activities that they had completed. The post-test results showed that seven students scored five marks and above, and one of the students managed to score a perfect eight full marks. The student who scored eight marks showed a good display of understanding and provided answers beyond the information that was given in the game activities.

During the focus group interview, when asked about how the game was played, the students described the strategies they used to play the game. This included preventing people from dying and one student explained that the goal was ‘to save people from calamity’, which is the correct answer. Overall, the students understood that the main goal of the game was ‘to save as many people as we can by implementing various strategies, which can include upgrading buildings and building shelters’. All students were able to describe the ‘upgrading of building’ as one of the preventive measure. One student mentioned the use of ‘budget’ in applying various strategies. The term ‘budget’ was one of the key aspects as all strategies required money to be implemented. The students were also able to recall most of the strategies that they used in the game, such as ‘upgrading the old building (retrofitting)’, ‘setting up an alarm system that provide a warning’, ‘setting up a radio system to alert the population’, ‘teaching students about the disaster’, and ‘creating a hospital and school’. All students agreed that it is much easier to remember the strategies by playing the game than by reading notes. When the students were asked if they were able to do the game activity as classwork and homework, they all agreed that they were able to do it, with the exception of one student who mentioned ‘only if they had an Internet connection’, while one student added the comment ‘only if the game is fun’. Another student mentioned that it was important to read the instructions before playing the game and to follow the instructions carefully as this could lead to a higher score in the game.

In terms of challenges, one student commented that the time allowed was too short but she also understood that both the time limit and budget were a part of the challenge that the game provided. Some students mentioned that the game was challenging but at the same time they were learning something from it and it was a rewarding experience. One student said, *it was like skipping class but we were still learning*.

CONCLUSIONS

The present study demonstrated the effectiveness of game-based learning. Comparison of the results of a pre-test and post-test show appreciable increases in student performance. Most students are able to write longer answers and can explain certain strategies. The game activity gave students an opportunity to play the role of a planner aiming to protect a population from earthquake hazards. This aligns with Gredler's (2004) idea of experiential exercise in that the educational game transports learners to another world. If students are able to apply their knowledge, skills and strategies in order to achieve, then it can be argued that game-based learning is not just a school activity but also a firsthand experience allowing the development of new skills. The effectiveness of game-based learning can be seen through the design of the game. Gredler (2004) also emphasized the design of an educational game. The present study revealed that the ISDR game could be used as an activity to refine already acquired knowledge. The game helps students identify their weaknesses and improve their understanding of the topic and allows students to summarize and review their knowledge, which improves the relationship between students and the concept of the knowledge. This is evidenced by the post-test result, where students were able to write longer answers. In addition, the ISDR game rewarded students with key facts if the students choose appropriate strategies; this gave students a sense of accomplishment in their actions and thus provided motivation to provide better answers. In this way, the use of a scoring system generated competition among students, who wished to score more highly than their friends.

Lastly, the most important aspect of effectiveness in learning is engagement. The present study showed that the students were interested in a game that had colorful graphics and involved upgrading and building. Tambroni and Skalski (2006) found that such features are the hallmarks of educational games. This level of immersion provides students with a new engaging experience that will further interest the gamer. In the present study, all students were able to discuss strategies in a focus group, showing their level of engagement in the game. Discussions in the focus group interview also revealed that students found the game more enjoyable and interesting to play compared with the normal reading of notes or normal classroom exercises. The students were motivated because they see game activity more as fun rather than a serious learning activity, such as a test quiz or an exam. Prensky (2001) suggested that computer games could provide a new way to motivate 21st century students. Malone (1981) agreed, stating that feedback on actions received by students affects the students' course of gameplay and gives students a sense of reward.

Meanwhile, there are features in games that can potentially demotivate students, as some game designs tend to highlight failure. In the focus group discussion, some students complained that they disliked how the game showed a fail report at the end if the student did not achieve a high score. Nevertheless, some students viewed the fail report as part of the challenge that they could try to improve in their next attempt. Overall, it is undeniable that game-based learning generates remarkable motivation and engagement. Students nowadays are accustomed to the use of technology and the digital educational game captures that essence. The important issue is the game design, and indeed, the use of a game to fully engage a student in learning is congruent with the kind of learning that should take place in the 21st century.

REFERENCES

- Aha, D., Molineaux, M., & Ponsen, M. (2005). Learning to win: Case-based plan selection in a real-time strategy game. In H. Muñoz-Ávila & F. Ricci (Eds.), *Case-Based Reasoning Research and Development*, pp. 5-20. Berlin Heidelberg: Springer.
- Blumberg, F. C., & Fisch, S. M. (2013). Digital games: A context for cognitive development. *New Directions for Child and Adolescent Development*, 139, pp. 11-20.
- Barab, A. S., Gresalfi, M., & Arici, A. (2009). Why educators should care about games. *Educational Leadership*, 67(1).
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper and Row.

- Dickey, M. D. (2005). Engaging by design: How engagement strategies in popular computer and video games can inform instructional design. *Educational Technology Research and Development*, 53(2), pp. 67-83.
- Fitzpatrick, C. (1993). Teaching geography with computers. *Journal of Geography*, 92(4), pp. 156-159.
- Froschauer, J., Zweng, J., Merkl, D., Arends, M., Goldfarb, D., & Weingartner, M. (2012). ARTournament: A mobile casual game to explore art history. In *Advanced Learning Technologies (ICALT)*, pp. 80-84.
- Gee, J. P. (2003). *What video games have to teach us about literacy and learning?*. New York: Palgrave Macmillan.
- Jaidin, J. H. (2009). *Conceptions of learning held by upper primary children in government schools in Brunei Darussalam*. Unpublished PhD thesis, Queensland University of Technology, Brisbane, Australia.
- Juul, J. (2012). *A casual revolution: Reinventing video games and their players*. MIT Press.
- Kahn, R. L., & Cannell, C. F. (1957). *The dynamics of interviewing: Theory, technique, and cases*. New York: Wiley.
- Kickmeier-Rust, M. D., & Albert, D. (2010). Micro-adaptivity: Protecting immersion in didactically adaptive digital educational games. *Journal of Computer Assisted Learning*, 26, pp. 95-105.
- Livingstone, S., & Haddon, L. (2011). *EU kids online: Final report: 2011*. London: London School of Economics.
- Maccoby, E. E., & Maccoby, N. (1954). The interview: A tool of social science. In G. Lindzey (Ed.), *Handbook of Social Psychology. Vol. 1, Theory and Method*. Cambridge, MA: Addison-Wesley.
- Malone, T. W. (1981). Toward a theory of intrinsically motivating instruction. *Cognitive Science*, 5(4), pp. 333-369.
- Gredler, M. E. (2004). *Games and simulations and their relationship to learning*. University of South Carolina.
- McClarty, K. L., Orr, A., Frey, P. M., Dolan, R. P., Vassileva, V., & McVay, A. (2012). *A literature review of gaming in education*. *Gaming in Education*. Retrieved April 15, 2014, from http://researchnetwork.pearson.com/wp-content/uploads/Lit_Review_of_Gaming_in_Education.pdf
- Mishler, E. G. (1986). *Research interviewing: Context and narrative*. Cambridge, MA, USA: Harvard University Press.
- Palfrey, J., & Gasser, U. (2010). *Born digital: Understanding the first generation of digital natives*. Basic Books.
- Pavlas, D. (2010). *A model of flows and plays in game-based learning: The impact of game characteristics, player traits, and player states*. Unpublished doctoral dissertation, University of Central Florida Orlando, Florida.
- Pidwirny, M. & Jones, S. (2014). Physicalgeography.net. *Physical geography*. Retrieved April 20, 2014, from <http://www.physicalgeography.net/>
- Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon*, 9(5), pp. 1-6.
- Prensky, M. (2006). *Don't bother me, mom, I'm learning! How computer and video games are preparing your kids for 21st century success and how you can help!*. New York: Paragon House.
- Rashid, R. & Jaidin, J. H. (2014). Exploring primary school teachers' conceptions of 'assessment for learning'. *International Education Studies*, 7(9), pp. 69-83.
- Renkl, A., & Atkinson, R. K. (2007). Interactive learning environments: Contemporary issues and trends. An introduction to the special issue. *Educational Psychology Review*, 19, pp. 235-238.
- Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). *Generation M2: Media in the lives of 8–18 year-olds*. Menlo Park, CA: Kaiser Family Foundation.
- Ritterfeld, U., Shen, C., Wang, H., Nocera, L., & Wong, W. L. (2009). Multimodality and interactively: Connecting properties of serious games with educational out-comes. *Cyberpsychology & Behaviour*, 12, pp. 691-697.
- Robert, P. (2010). *Best practices in action research for teacher candidates*. USA: Rowman & Littlefield Education.
- Salen, K. (2008). Toward an ecology of gaming. *The Ecology of Games: Connecting Youth, Games, and Learning*, pp. 1-20.

- Shaffer, D. W. (2006). *How computer games help children learn*. Macmillan.
- Shute, V. J., Ventura, M., Bauer, M., & Zapata-Rivera, D. (2009). Melding the power of serious games and embedded assessment to monitor and foster learning. *Serious Games: Mechanisms and Effects*, 2, pp. 295-321.
- Squire, K. (2011). *Video games and learning: Teaching and participatory culture in the digital age. Technology, education—connections (the TEC Series)*. New York, NY: Teachers College Press.
- Tambroni, R., & Skalski, P. (2006). The role of presence in the experience of electronic games. In P. Vorderer & J. Bryant (Eds.), *Playing video games, responses and consequences*, pp. 225-240. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Tüzün, H., Yılmaz-Soylu, M., Karakuş, T., İnal, Y., & Kızılkaya, G. (2009). The effects of computer games on primary school students' achievement and motivation in geography learning. *Computers & Education*, 52(1), pp. 68-77.
- Williamson, B. (2009). *Computer games, schools, and young people: A report for educators on using games for learning*. Bristol: Futurelab.

Investigation of Sleep Quality Parameters To Improve Cognitive Performance in Classroom Tests

Alisa FUKUDA

American School In Japan

Tokyo, Japan

19fukudaa@asij.ac.jp

Robin GARHWAL

Tokyo Institute of Technology

Tokyo, Japan

garhwal.r.aa@titech.ac.jp

ABSTRACT

Potential ways to improve classroom test performance were explored through finding the correlation between sleep quality and cognitive performance in young adults. Participants were asked to track their sleep using a smartphone application, take an online cognitive test the following day and submit their results through an online form. Parameters of sleep such as total hours of sleep and hours of deep+REM sleep were measured using a built-in accelerometer in smartphones. The online cognitive test measured reaction times and accuracy of answers. Preliminary results show that more hours of deep+REM sleep lead to faster reaction times and higher accuracy.

INTRODUCTION

Sleep quality is an understudied area and often overlooked factor of cognitive performance. This can lead to a possible neglect in ensuring sufficient sleep, especially amongst high school and university students, which can result in a gradual decline in academic performance unknowingly. A poll conducted by the National Sleep Foundation established that 63% of surveyed Americans were getting insufficient sleep. A study conducted by June J. Pitcher (1997) investigated the difference in performance between sleep deprived and non-sleep deprived participants. Pitcher et al. split their participants into two controlled groups, one sleep deprived and one non-sleep deprived. Participants in the sleep deprived group were not allowed to sleep for 24 hours and participants in the non-deprived group had a set time for going to sleep and waking up. The participants were then subjected to the same test and results were compared. Some disparities in test scores were observed in both groups. Another study by Megan Lowry (2010) found that average amount of sleep per night was significantly correlated with GPA. Lowry required participants to fill out a self-evaluated survey on their past night's sleep and submit their GPA. In addition, K. Ahrberg et al. (2012) also investigated the interaction between sleep quality and academic performance, having their participants fill out a survey. The Pittsburgh sleep quality index, a numerical index derived from self-answered questions related to sleep habits, was used in the survey. The answers from the survey were compared to students' GPA. Using GPA to investigate the relationship between sleep quality and academic performance is influenced by individual IQ and the acquired GPA cannot be deemed to be a function of sleep quality exclusively. Furthermore, the work of Dewald et al. (2010) is a very comprehensive study of the influence of sleep quality in children and adolescents. The study investigated the effects of sleep quality, sleep duration and sleepiness on school performance as well as the possible influences of parameter assessment. It looked into different results based on age and gender as well as the relationship the two categories had with sleep. However, their methodology was quite different as no direct data was collected in their work. Instead, they used the data and results of other articles for their study. By looking at the way sleep was assessed in other papers, Dewald et al. noted that larger effects were found for studies using subjective sleep assessment methods. The data for all of the above-mentioned work on sleep quality and cognitive/academic performance were measured through surveys, which required self-evaluated answers. This approach can be considered very subjective. In all surveys, participants were asked elementary questions such as the time they slept, woke up, the number of all-nighters they pulled in the past week, their thoughts on their quality of sleep, and how they felt the next day.

Such basic questions do not provide enough information because they are not specific, and the possibility of participants recalling past data inaccurately exists. In addition, data collected via such self-evaluated means have the following demerits: (i) they are non-statistical, (ii) they are prone to distortion based on participant mood, (iii) they suffer from bias, either being too lenient or too severe. Therefore, this research was conducted using technology-assisted data collection methods to investigate how sleep quality affects cognitive performance. A sleep tracking application and an online cognitive test were used for the data collection. Recent advances in technology have made collection of sleep data through smartphone devices more accessible to the public, thus allowing for quality sleep related statistical data to be collected easily. Three sleep parameters and four cognitive performance parameters were identified and their correlation studied. The major difference between academic and cognitive performance is that academic performance is derived from formal academic examinations testing school curriculum, while cognitive performance measures general problem solving and reaction behavior. The selection of cognitive performance over academic performance is that cognitive performance has the merit of isolating the sleep quality factor by eliminating other factors such as IQ. The rest of the paper is organized as follows: Section 2 describes the methodology, Section 3 analyzes the collected data using the Pearson Correlation, and Section 4 discusses the obtained results.

METHODOLOGY

Measurement of Sleep Quality

The study commenced with a systematic evaluation of several different sleep tracking applications to identify the most appropriate application. The sleep tracking applications considered were:

- i. Sleep Cycle by SleepCycle
- ii. Sleep Better by Runtastic
- iii. Sleep Time Free by Azumio
- iv. Pillow by Neybox
- v. Sleep Bot by SleepBot
- vi. Good Morning Alarm Clock by Apalon

The selection criteria was as follows: the chosen application had to be available on smartphones with different operating systems using a freemium model, previous history data had to be available on the phone, and the following sleep metrics had to be directly measureable:

- i. Length of total sleep, T_s
- ii. Length of deep sleep, D_s
- iii. Sleep efficiency, $S_{efficiency}$

Length of total sleep is simply the sleeping duration of a subject. The length of deep sleep is defined as the duration of deep sleep. Both of these metrics are measured using the accelerometer embedded in the phone. An accelerometer is a sensor that measures movement by detection of acceleration in the x, y, and z planes. Thus, with the phone placed next to the subject's pillow, the subject's movement during a specified interval of time can be measured. Measured movement is inversely proportional to the quality of sleep: greater movement would indicate lighter sleep, and less movement would indicate deeper or REM sleep. REM sleep stands for Rapid Eye Movement sleep, which is the deepest state of sleep a subject can obtain. The sleep efficiency $S_{efficiency}$ is calculated by the sum of the hours of light sleep L_s and deep sleep D_s divided by length of total sleep T_s and finally multiplied by 100.

$$S_{efficiency} = \frac{(L_s + D_s)}{T_s} \times 100$$

where the length of light sleep L_s is the difference between total sleep T_s and deep sleep D_s .

Based on the above selection criteria, the "Sleep Time Free" application was selected for measurement. For consistency, all participants were required to use the "Sleep Time Free" application for data measurement. Participants were asked to track their sleep a total of 4 times per person and limited to 2 times a week.

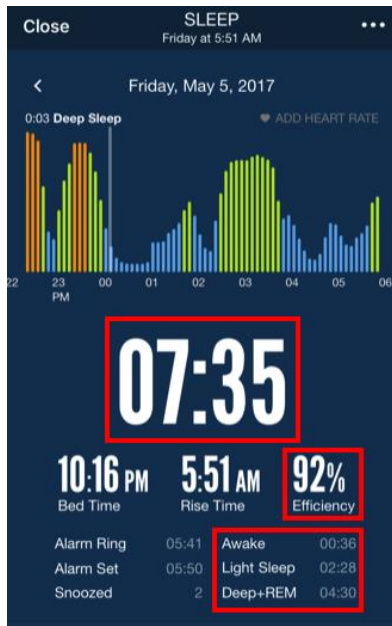


Figure 1: Screenshot of the “Sleep Time Free” application showing measured data

Measurement of Cognitive Performance

Selection of an appropriate online cognitive assessment was carried out next based on identified requirements. The following five candidate assessments were identified:

- Test My Brain
- Mental Speed Test
- My Brain Test
- Stroop Effect Test
- Mouse Accuracy

Similar to the sleep tracking applications, the online test was chosen based on the fulfillment of certain conditions. Stipulated conditions were:

- IQ-free questions i.e. those questions that measure cognitive performance and mental quickness exclusively
- Results showing speed and accuracy
- Questions of sufficient complexity such that participants’ sleep would be bound to affect results i.e. excluding simple questions that even sleep deprived participants could answer correctly

The assessment selected was the “My Brain Test”. This assessment comprises of True or False types of questions to state the correspondence between a graphics-noun pair, shown in the figure below.

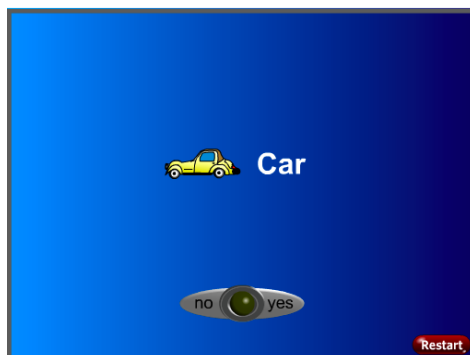


Figure 2: Example question of the “My Brain Test” that measures mental quickness

Specifically, the test displays a picture and word pair, and participants choose “yes” or “no” depending on the pictorial and literal correspondence. There are also trick questions labelled “reverse”, where a non-matching pair has true correspondence and a matching pair has false correspondence. There are 21 questions in each test.

Parameters derived from cognitive performance were average reaction time, percent accuracy, standard deviation of average reaction time, and score. This is shown in the figure below.

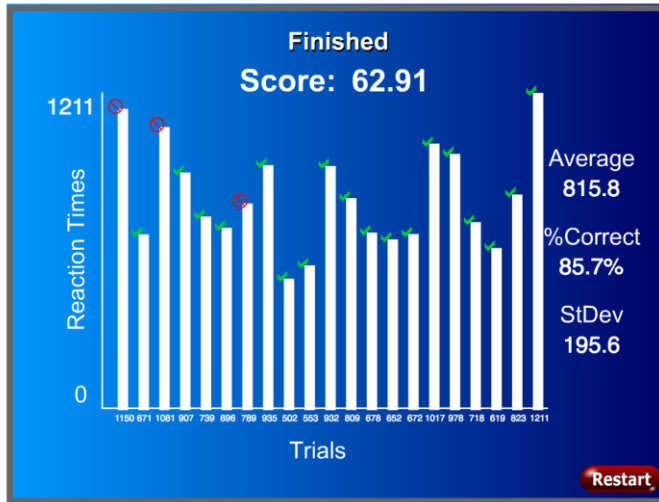


Figure 3: Example result of the “My Brain Test”

Population Surveyed

Our research had 12 participants, the age bracket being fourteen to fifty years old from mostly academic backgrounds. 58% of the population were male and 42% of the population were female. The mean age was 26.7 years and the median age was 24 years. The data collection was done in Tokyo, Japan from March to August 2017.

The data collection was primarily carried out through online means. Participants were required to enter their sleep quality data, collected using the “Sleep Time Free” application, through an online form and submit a screenshot of their results from the “My Brain Test” cognitive test. The usernames of participants were kept consistent through multiple submissions to make analysis of individual data possible. In order to be able to objectively analyze and track individual sleeping patterns and make individual-specific conclusions, multiple individual responses were necessary. Thus, the survey population was kept low but multiple responses were supplied by each participant, ranging from 3 to 15. In all, a total of 70 responses were collected.

RESULTS

Using the collected data, the correlation between the sleep parameters and cognitive performance parameters were determined. Results are summarized below.

The Pearson correlation was utilized to establish the correlation between each of the two sleep parameters with all of the four cognitive performance parameters. Correlated pairs were:

- i. Sleep Efficiency (E) and Average Reaction Times (Average RT)
- ii. Sleep Efficiency (E) and Percentage Accuracy
- iii. Sleep Efficiency (E) and Score
- iv. Sleep Efficiency (E) and Standard Deviation of Average Reaction Times (SD)
- v. Deep Sleep (DS) and Average Reaction Times (Average RT)
- vi. Deep Sleep (DS) and Percentage Accuracy
- vii. Deep Sleep (DS) and Score
- viii. Deep Sleep (DS) and Standard Deviation of Average Reaction Times (SD)

The graph of Figure 4 below displays the combined correlated pairs outlined above for five individuals represented by the five individual colored bars.

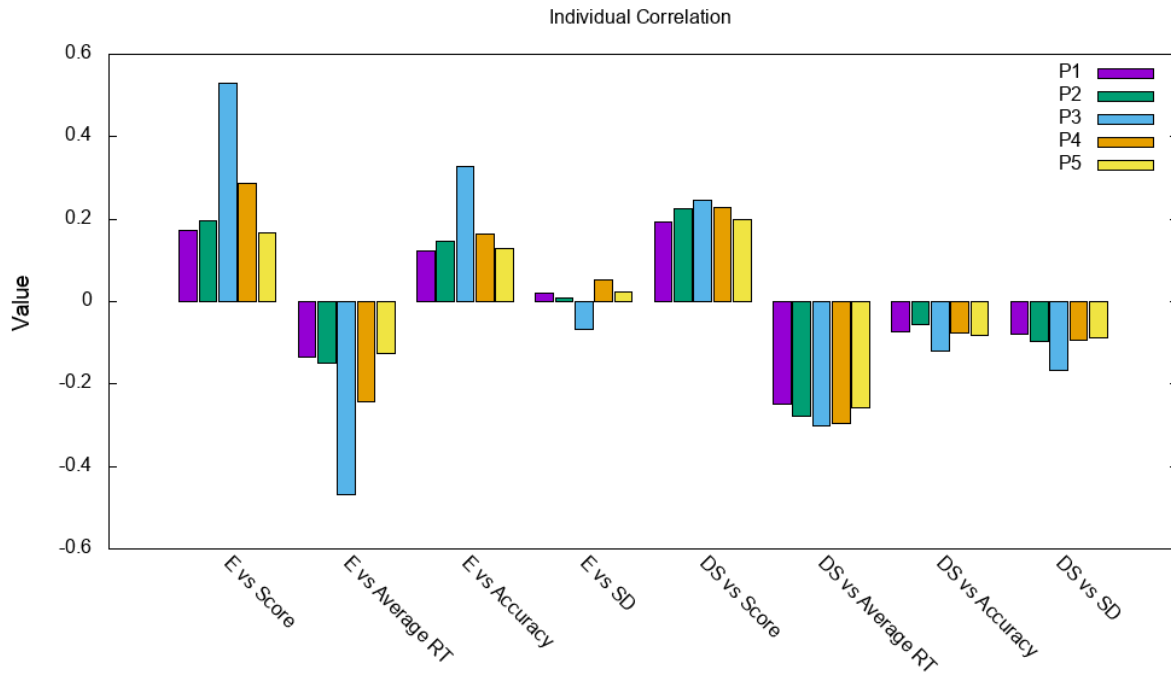


Figure 4: Graph of Individual Sleep Performance Correlation

As evident from the graph above, the correlation of Deep Sleep and cognitive performance parameters on the right half of the plot were tightly correlated, while Sleep Efficiency and cognitive performance parameters exhibited weaker correlation i.e. the correlation magnitudes varied significantly.

Figure 5 displays the average correlated pairs outlined above for all participants represented by the purple colored bars. The error bars indicate standard deviation.

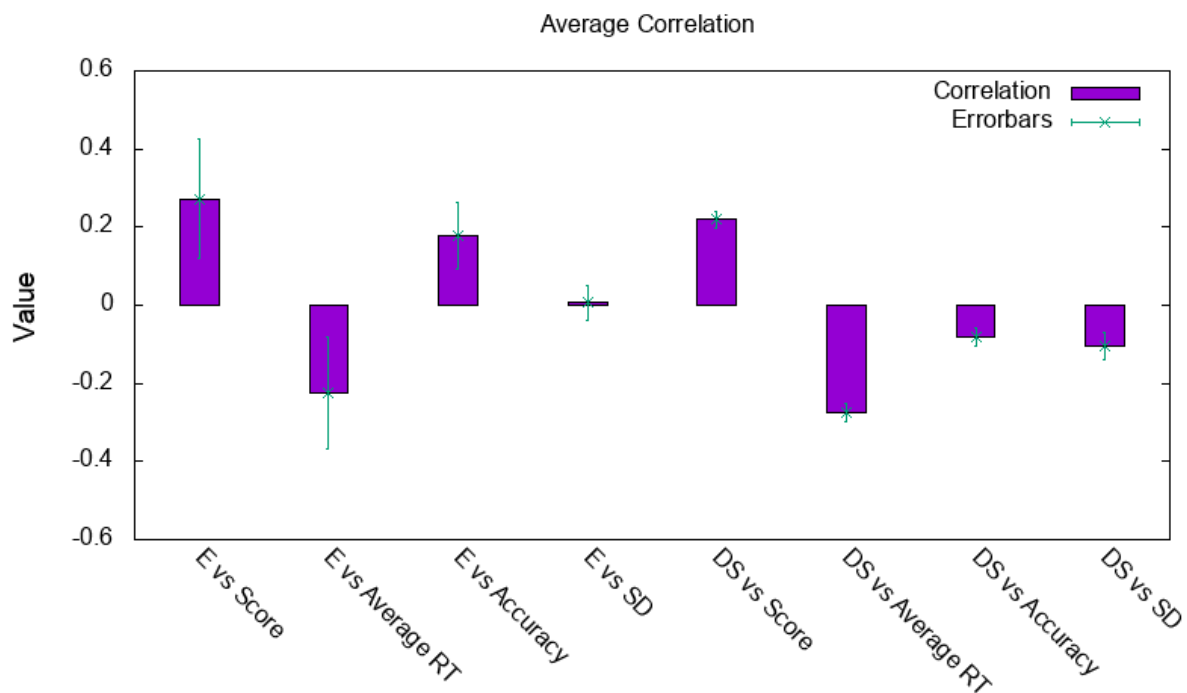


Figure 5: Graph of Average Correlation

As seen in the above graph, error bars of the Deep Sleep and Cognitive Performance parameter pair are smaller, indicating that the individual data was more consistent which is in agreement with the first graph.

The correlation between the sleep parameters and cognitive performance parameters of all participants is given in the tables below.

	Cognitive Performance Parameters	Correlation Value
Sleep Efficiency (%)	Average Reaction Times (ms)	-0.126
Sleep Efficiency (%)	Accuracy (%)	0.129
Sleep Efficiency (%)	Score	0.168
Sleep Efficiency (%)	St. Deviation of Avg. Reaction Times (ms)	0.023

Table 1: Table of Correlation Values between Sleep Efficiency and Cognitive Performance

	Cognitive Performance Parameters	Correlation Value
Deep Sleep (min)	Average Reaction Times (ms)	-0.259
Deep Sleep (min)	Accuracy (%)	-0.082
Deep Sleep (min)	Score	0.199
Deep Sleep (min)	St. Deviation of Avg. Reaction Times (ms)	-0.088

Table 2: Table of Correlation Values between Deep Sleep and Cognitive Performance

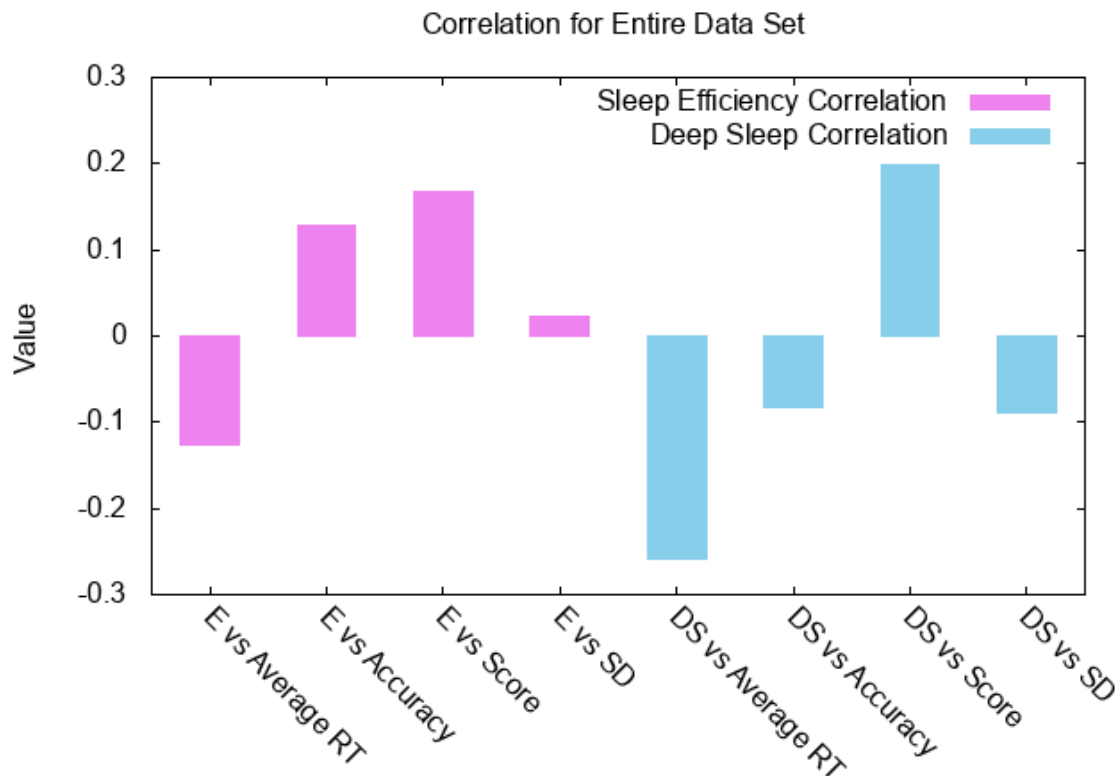


Figure 6: Graph of Correlation for Entire Data Set

By calculating the correlation between Sleep Efficiency and various factors, certain patterns in terms of Sleep Efficiency and cognitive effectiveness can be identified. The sign of the correlation value determines correlation type. A negative value indicates an inversely proportional correlation while a positive value indicates a directly proportional relationship. Specifically, the correlation between Sleep Efficiency and Average Reaction Times is **-0.126**. This medium negative correlation implies that a higher Sleep Efficiency results in faster average reaction times on the cognitive test. For the Sleep Efficiency and Accuracy correlation pair, a medium positive correlation of **0.129** was obtained. This implies a higher Sleep Efficiency results in a higher accuracy on the cognitive test. Similarly, the medium positive correlation between Sleep Efficiency and Score is **0.168** which suggests that a higher Sleep Efficiency will lead to a higher score on the cognitive test. On the other hand, a correlation value of **0.023** was acquired between Sleep Efficiency and Standard Deviation of Average Reaction Times pair.

Both the correlation values of Deep Sleep vs Average Reaction Times and Deep Sleep vs Standard Deviation of Average Reaction Times exhibit a medium negative correlation, with values of **-0.259** and **-0.088** respectively. This is interpreted as a longer duration of Deep Sleep resulting in faster reaction times, as well smaller standard deviations of the average reaction times. The correlation between Deep Sleep and Score is **0.199** is a medium positive correlation, implying that a longer duration of Deep Sleep results in a higher score on the cognitive test. The correlation between Deep Sleep and Accuracy is **-0.082**. A visual representation of these results is given in the graph of Figure 6.

CONCLUSIONS

Sleep quality related data was collected using a sleep tracking application and the correlation between sleep parameters and cognitive performance was investigated. It was determined that a longer duration of Deep Sleep and higher Sleep Efficiency would result in faster reaction times and a higher score. In addition, higher Sleep Efficiency would result in higher accuracy on the cognitive test. From the results, it was determined that the correlation between duration of Deep Sleep and cognitive performance parameters were more similar among individuals. Since the calculation of Sleep Efficiency includes total length of sleep, total length of light sleep, and total length of deep sleep, results show that out of the three durations, deep sleep is most important in terms of affecting cognitive performance. Thus, it was concluded that Deep Sleep could possibly affect cognitive performance more consistently than Sleep Efficiency. Based on these results it is reasonable to conclude that ensuring better sleep quality is one potential way of improving cognitive performance in classroom tests.

REFERENCES

- Ahrberg, K., Dresler, M., Steiger, A. & Genzel, L. (2012). The interaction between sleep quality and academic performance. *Journal of Psychiatric Research* 46, (pp. 1618-1622).
- Dewald, J.F., Meijer, A.M., Oort, F.J., Kerkhof, G.A. & Bögels, S.M. (2010). The influence of sleep quality, sleep duration and sleepiness on school performance in children and adolescents: A meta-analytic review. *Sleep Medicine Reviews* 14, (pp. 179-189).
- Lowry, M., Dean, K., Manders, K. (2010). The link between sleep quantity and academic performance for the college student. *Sentience*, 3, 16-19.
- Pilcher, J.J. & Walters, A.S. (1997). How Sleep Deprivation Affects Psychological Variables Related to College Students' Cognitive Performance. *Journal of American College Health*, 46:3, 121-126, DOI: 10.1080/07448489709595597.

Iranian ESL Students' Language Learning Strategies: A Look at Proficiency, and Gender

Mojtaba GHOLAMIAN

Azad, Azad University of Bojnord

Mehrdad TIMACHI

University of Bojnord

mehrdadtimachico@gmail.com

Afshin KHAFI

University of Bojnord

Raha SOLEYMANI

University of Bojnord

ABSTRACT

This article reports on a study of language learning strategies used by 50 ESL students from Iran. The aims of the study were to observe and survey the frequency of strategy use and to discover how it is influenced by the learner's proficiency level and gender. The SILL questionnaire (Strategies Inventory of Language Learning) by Oxford was administered. It contained 6 categories: memory, cognitive, compensation, metacognitive, affective and social. Results from the survey signifies that metacognitive strategies were most frequently used, while memory strategies were used to the contrary. Statistical analysis revealed that significant differences were to be found in the use of cognitive and compensation strategies among learners at three proficiency levels. Gender also was a key figure on influencing the kinds of strategy used; female students reported to use affective and memory strategies more regularly than male counterparts. Results of this study could help teachers identify appropriate strategies to facilitate the learning of a second language by Iranian learners. It also could assist teachers with being more sensitive and about the new and mostly unknown strategies to their students. **KEYWORDS:** Language learning strategies, Direct strategies, Indirect strategies, Gender, Level of education, Proficiency

INTRODUCTION

Over the past few years, there have been many studies of learning strategies used by language learners. These studies have been conducted mainly to find out what strategies learners use, as well as what factors affect these choices so we can know more to help them enhance their perception of English. Since we have numerous studies, it is difficult to compare findings because of two obvious reasons. One reason is that most of the studies have been conducted on mixed groups of students with different backgrounds and experiences. More importantly, studies have reported that the effect of variables such as language proficiency and cultural background are involved in this issue. Findings indicated that successful language learners engage in purposeful language learning and tend to use more language learning strategies than the ones that are less effective. Learning strategies have considerable potential for enhancing the development of oral skills in English as a second language. Learning strategies are used by "good" language learners to assist them in gaining command over required skills (Naiman, Frohlich, Stern, and Todesco 1978), and are positively associated with language acquisition (Politzer and McGroarty 1983). Subjects are ESL students in Iran. The overall aim of this research is to identify learning behavior tendencies and patterns that are representative of this growing group of ESL students.

We hope to better understand students' needs and, in particular, help them develop appropriate strategies that may enhance their language learning. Data was collected through surveys and observations on the assortments of learning strategies used for various types of language learning activities by ESL (English as a second language) students. In this research, we report the initial findings from one study which surveyed the learning strategies employed by students. We also examined the influence of two variables – language proficiency and gender – on strategy use, in addition to determining the frequency of use.

2. REVIEW OF LITERATURE

2.1. Viewpoints on Language Learning Strategies

Many research have described language learning strategies as “... strategies that contribute to the development of the language system which the learner constructs and (which) affect learning directly” (Rubin, 1987, p. 23). Oxford (1990) further defined language learning strategies as steps taking to facilitate the acquisition, storage, retrieval and use of information. O'Mally and Chamot (1990) studies viewed learning strategies as “the special thoughts or behaviors that individuals use to help them comprehend, learn or retain new information” (p. 1). The term ‘strategy’ in the context of language learning refers to a specific type of action on behavior reported to by a language learner in order to improve performance in both using an learning a language (Naiman , Frolich, Stem & Todesco 1978; Wenden & Rubin 1987; Oxford 1990). Good and successful learners can improve their learning process by exploiting the strategies and make the less effective students follow the same pattern.

Some have provided evidence which strongly indicates that learning strategies interact with other variables to affect language proficiency (Gardner and MacIntyre 1993). As we know, there are various factors affect the use of strategy by learners. Oxford (1989) list is a great example of different factors in learning, which consisted of the followings: language being learned; duration; degree of awareness; age; gender; affective variables such as attitudes, motivation level/ intensity, language leaning goals, motivational orientation; personality characteristics and general personality type; learning style, aptitude; career orientation; national origin, language teaching methods, task requirements (Goh 1997).

Learning strategies assist learners in becoming effective in learning process as well as applying to a language, more importantly enable them to self-direct these endeavors.

2.2. The Aim on Language Learning Strategies

This study exposed language learning strategy use of English learners, looked at the relation between second language proficiency and language learning strategy, and estimated any differences in strategy use by gender. So important is the role of strategy use in learning a second language that some theorists have included it in their models of second language learning (e.g. McLaughlin 1987; MacIntyre 1994) (Goh 1997).

2.3. Classification of Learning Strategies

Number of literatures defined language learning strategies as strategies that language learners build in order to cause the development of the language system which affect learning process shortly (e.g., Rubin, 1987; Stern, 1975; Wenden, 1987). Regarding to the numerous studies that have been conducted in the past decades, long list of strategies have been recognized. (e.g., Rubin, 1987; O'Malley and Chamot, 1990). Also Oxford reported that there were at least dozen different classifications. In general, the strategies categorizes in four groups, i.e. strategies that unable learners to (Goh 1997):

1. Comprehend, store, retrieve and use information
2. Manage and direct their learning through reflection and planning
3. Control their emotions
4. Create opportunity to practice that target language with other people

Oxford (1990) proposed that strategies are mainly divided into two categories; direct and indirect.

Direct strategies necessitate mental processing of the target language. There are three main groups of direct strategies. These groups process the language differently and for various goals.

- a. Cognitive strategies: These include processing the target language in order to clarify the meaning through processes such as reasoning and analyzing.
- b. Compensation strategies: These allow learners to fill the gaps in their knowledge and skills. For instance, guessing meanings and gesticulation.
- c. Memory strategies: These include mental processes used in organizing information in order, forming coalition, and evaluating.

Indirect strategies, from the other point of view, uphold and bring about language learning often without interacting the target language straightforwardly.

- a. Metacognitive strategies: These allow learners to organize, examine, and direct their own learning as well as to supervise their errors.
- b. Affective strategies: These enable learners to rule their emotions, sentiments, and stimulus through anxiety reduction, self-encouragement, and self-reward.
- c. Social strategies: These help the learners to communicate with other people in order to improve their learning through questioning, collaborating.

3. THE STUDY

This study was conducted to focus on the learning strategies of ESL students from Iran. More explicitly, we wished to provide answers to the following questions:

1. Do language proficiency and gender have any impact on the use of these strategies?
2. What kind of learning strategies do Iranian students tend to use more frequently?

4. METHODS

4.1 Participants

The subjects were 50 students from Iran. Their average age was 20, and they have previously studies English. The subjects reported having studied English for sum total period of time ranging from six months to three years. For the purpose of this study, the students were categorized into three levels of proficiency: Advanced, Intermediate, and Beginning, based on an IELTS sample test which was conducted to assess their reading, speaking, listening, grammar, and composition. Learners engaged in the test of English proficiency for 2 – 3 hours in the classroom. When ranked by these levels on tested proficiency with English, there were 12 Beginning, 23 Intermediate, 15 Advanced learners. The test was moderately balanced among males (n=18) and females (n=32).

Table 1

Demographic description of subjects

	<i>n</i>	<i>%</i>
English Proficiency		
<i>Beginning</i>	12	24.0
<i>Intermediate</i>	23	46.0
<i>Advanced</i>	15	30.0
Gender		
<i>Male</i>	18	36.0
<i>Female</i>	32	64.0

4.2 Instruments

The instrument used in this study was the 50-item Strategy Inventory for Language Learning (SILL) (version 7.0,

ESL/EFL student version) devised by Oxford (1990) (see the Appendix for a copy of the SILL). This questionnaire examines the learning strategies that participants perceive themselves as using.

The SILL instrument contains 50 short statements each describing the use of one strategy. Regardless of the fact that some issues prevalent upon self-report questionnaires, “can provide information from a large population, and the information can be compared and interpreted objectively through statistical data analysis” (Park, 1997, p.212). Additionally, as Oxford and Burry-Stock (1995) state, such methods of data collection are easy and quick for administration, cost-effective, and nonthreatening.

In the SILL, language learning strategies are categorized into six groups for appraisal: Memory strategies for receiving and transmitting the data, Cognitive strategies for comprehending and creating the language, Compensation strategies for overwhelming restrictions in language learning, Metacognitive strategies for programming and scanning learning, Affective strategies for managing sentiments, motivation, and Social strategies for collaborating with others In language learning.

The choices were given numerical standards that proved the extent of the tendency of the participants towards the items of the questionnaires, on a five-point Likert scale ranging from 1 (“Never or almost true of me”) to 5 (“Always or almost true of me”). For the SILL questionnaire and scoring procedures, visit Oxford (1990, p. 293-300).

Numerous studies have shown reliability coefficients for the SILL ranging from .85 to .98 making it a trusted measure for evaluating students’ reported language learning strategy use (Bremner, 1998; Oxford and Burry-Stock, 1995; Park, 1997; Sheorey, 1999; Wharton, 2000).

In this study, we avoided distributing the Persian translation to the subjects on account of the questionnaire was worded in very simple English. Anyhow, we encouraged participants to ask us to clarify statements or words which they failed to comprehend. We also gave them carte blanche to refer to the dictionary whenever needed. Due to the fact that the statements were easy enough to understand, there were only a few questions from the participants.

4.2 Data Collection

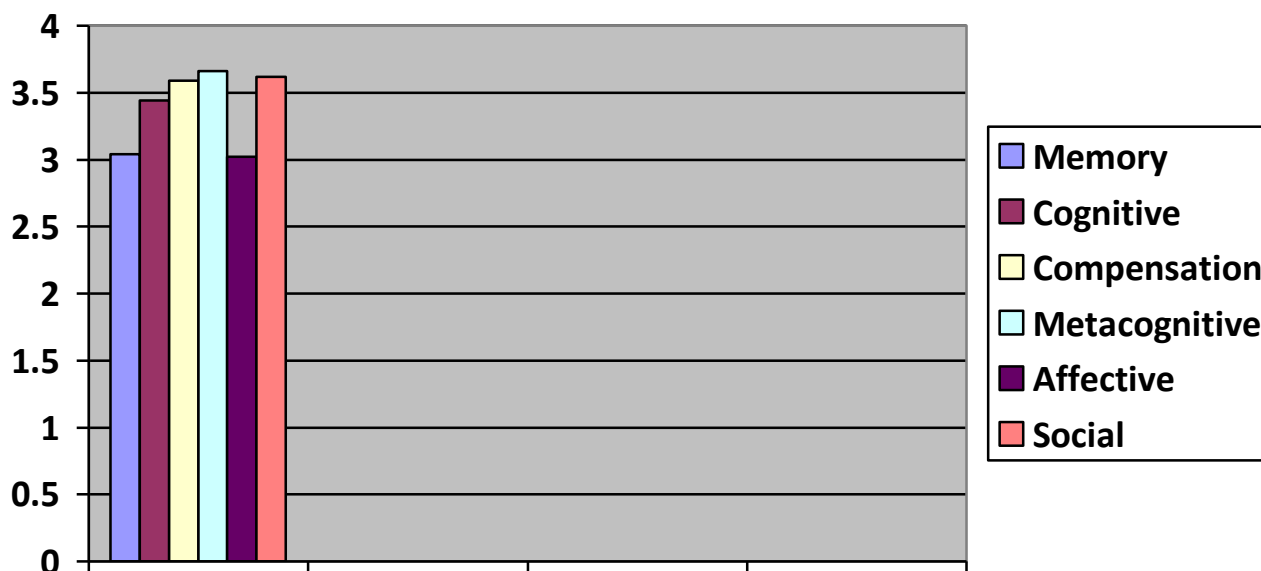
The SILL was executed to students during a regular class by teachers. The students were told that there were no true or false answers to any question and that their secrecy was guaranteed and their replies would be exclusively used for research purposes. They were also guaranteed that their involvement in the test would not have any effect on their grades, and they could halt cooperation anytime. Nonetheless, everybody chose to cooperate. Data analysis involved the computation of this descriptive statistics (mean, standard deviation, and frequencies) in order to collect information or data about demographics of the participants and to compute strategy use. In order to settle any variation in strategy use relative to English proficiency, gender, an analysis of variance (ANOVA) was conducted using these factors as independent variables and the six categories of strategies of dependent variables. The Scheffe’ post-hoc test was used to explore where nay significant differences in strategy use lay.

5. RESULTS

5.1 Overall Strategy Use

The Scheffe’ post-hoc test exposed statistically significant difference in the use of memory affective strategies compare to cognitive, compensation, metacognitive or social strategies (Hong-Nam, 2006). These four categories ranked high in use ($M=3.4 - 5.0$). The least preferred strategies were affective ($M=3.02$) and memory ($M=3.04$). The most preferred group of the six strategy categories for participants was metacognitive strategies ($M=3.66$) followed by social strategies ($M=3.62$). Compensation strategies ($M=3.59$) and cognitive strategies ($M=3.44$).

Figure 1
Means Profile of SILL Categories



As can be seen from figure 1, the Iranian students reported using metacognitive strategies more often than any other kinds of strategy. Metacognitive strategies are administrative processes that regulate learning, and involve strategies for programming, scanning, and evaluating. Based on a preliminary analysis of the student's responses, it showed that one the most common metacognitive strategies were noticing their English errors and using that information to assist in enhancing their English learning.

One of the results that aroused from our study shows that memorization was the least regularly used strategy among the participants. This shed a light on the fact that students spent remarkably more time managing their learning than saving and remembering new information. This result seems to be in contrary to the commonly accepted accounts of the leaning strategies of Iranian learners.

Albeit Iranian learners are accustomed to memorization than comprehension, the findings of this study revealed that learners made very little use of specific methods to improve their memorization. Some of the memory strategies mentioned in the questionnaire are: connecting the sounds of new words to an image or picture, making a mental picture of a situation in which a word might be used, using rhymes, physically acting out a word, and remembering new words or phrases by remembering their location on pages, the board, etc. We justify that the subjects probably did not know about these methods.

Our conjecture later on was verified when we interviewed twelve students about their strategies for learning new vocabularies. The students reported that despite their efforts for memorizing new words, they did not use any of the methods in the questionnaire at all. They relied on remembering new words by rote. For instance, some students said that they devoted most of their time memorizing words consistently and repeatedly.

The data exported from the SILL analysis implied that not all learners employ learning strategies very often despite our discoveries.

5.2 Effects of Language proficiency

Another goal of our study was to examine whether learners of different language proficiency alter in their use of learning strategies.

When participant data was sorted by tested English proficiency (Beginning, Intermediate, or Advanced level) data analysis exposed statistically significant differences for the use of metacognitive strategies. Compensation strategies were used more by the Intermediate level participants than the Advanced level. ($F=5.04$, $p=0.01$). The most preferred strategy category for student in Beginning and Intermediate levels were metacognitive strategies ($M=3.51$ and $M=3.77$). The Advanced group used social strategies as the most frequently used strategies, ($m=3.67$). The least preferred categories for Beginning and Intermediate groups were affective strategies ($M=3.21$ and $M=2.92$), and for Advanced level was memory strategies ($M=2.97$).

Table 2

Descriptive statistics for the variables and F-test for main difference between the six strategy categories

Variable	Mean	SD	Minimum	Maximum	Rank	F	Significance	Difference
Memory	3.04	0.42	2.00	4.22	5	20.79	0.00	Mem, Aff
Cognitive	3.44	0.43	2.64	4.71	4			< Cog,
Compensation	3.59	0.49	2.50	4.67	3			Com, Met,
Metacognitive	3.66	0.48	2.56	4.67	1			Soc
Affective	3.02	0.53	1.67	6.33	6			
Social	3.62	0.51	2.33	5.00	2			
Total	3.40	0.55	1.67	5.00				

Mem (Memory strategies), Cog (Cognitive strategies), Com (Compensation strategies), Met (Metacognitive), Aff (Affective strategies), Soc (Social strategies)

5.3 Use of Strategies by Gender

This study explored a statistically significant difference in the use of affective strategies between males and females ($F=3.98$, $p=0.05$). Females reported higher use of affective strategies. And also the results revealed that females ($M=3.45$) engaged in strategy use more often than males ($M=3.34$). Males prefer the use of metacognitive ($M=3.65$) and compensation strategies ($M=3.62$) most, and affective strategies the least ($M=2.87$). Female participants reported using social ($M=3.70$) and metacognitive strategies ($M=6.67$) most and memory strategies the least ($M=3.06$). Table 3 displays results for the use of language learning participants were grouped by gender.

Table 3

Summary of variations in use of strategy categories by gender

Variables	Male		Female		F	Significance	Difference*
	Mean	SD	Mean	SD			
Mem	3.01	0.37	3.06	0.46	0.15	0.70	M < F
Cog	3.34	0.39	3.53	0.44	2.73	0.10	
Com	3.62	0.51	3.57	0.48	0.13	0.72	
Met	3.65	0.52	3.67	0.46	0.03	0.87	
Aff	2.87	0.53	3.14	0.50	3.98	0.05	
Soc	3.54	0.49	3.70	0.53	1.25	0.27	
Total	3.34	0.55	3.45	0.54	3.13	0.08	

Mem (Memory strategies), Cog (Cognitive strategies), Com (Compensation strategies), Met (Metacognitive), Aff (Affective strategies), Soc (Social strategies), M= Male, F=Female.

* $p < 0.05$

6. SUMMARY AND CONCLUSION

We realized that these learners choose to use metacognitive strategies more than the other ones.

Memory strategies were informed to be the least strategies used by learners. We also found out that there was a highlighted distinction between genders regarding the use of compensation and affective strategies. Furthermore we discovered that there's a crucial difference in the use of cognitive and compensation strategies by learners at elementary and advanced degrees of proficiency. Teachers need to be clear in building declarative knowledge that assists students in having a deep comprehension of the impact of languages learning on their lives. The least strategies used by participants in this paper were memory and affective strategies. These learners have revealed that in spite of their endeavors to remain calm when they were skeptical about speaking English, their concern about making an error made them refuse trying to speak. Asian countries have more tendency to listen to others rather than engaging in a public discussion. As the learners taking part in this examination were Iranians, their upbringing and previous school experiences may have impacted upon their demeanors in this area (Politzer, 1983; Reid, 1987).

At first, inferior use of memory strategies were stunning, however, additional investigation of the literature exposed that different studies have also found opposing results and discoveries to this may be too common hypothesis that Iranian students have very effective fondness of memory strategies rather than communicative strategies as an example of collaborating with other people, asking and seeking help, and working with peers (Al-Otaibi, 2004; Bremner, 1998; Politzer and McGroarty, 1985; Wharton, 2000; Yang, 1999).

Yet another probability is that memory strategies shall be explained distinctively in various studies. In 1985, Politzer and McGroarty found that memory strategies had a great popularity amongst ESL learners. They limited memory strategies as routine memorization of words, phrases, and sentences. In the contrary, the least used memory strategies in the SILL for the present study were not even remotely connected to routine memorization, rather they were approaches such as acting out new vocabularies, using rhymes, and creating mental images. It might be probable that these approaches were less appealing and popular with adult and mature learners and therefore not employed as much or at all. High ranked memory strategies approaches were reviewing English lessons regularly, and using words and phrases in sentences.

In 1994, Paris et al. recognized three styles of knowledge obtained as learners' progress from beginner to advance in their classic work on strategic reading: declarative knowledge, procedural knowledge, and conditional knowledge. Declarative knowledge is depicted as knowledge about learning activities and personal skills. Procedural knowledge is knowledge about how to best learn. Knowing how to scan a text for finding answers to objective questions is a good example of procedural knowledge. As both of these kinds of knowledge are unavoidable to assist a learner along the path from beginner to advance, they are not sufficient enough on their own. Conditional knowledge, as the third kind, completes the hierarchy of strategic learning by permitting the learner to manage his or her learning by selecting the accurate strategy for the proper activity (Hong-Nam 2006).

Anyway, intermediate level learners have procured a point in their education and learning where have acquired adequate vocabulary and capability with the L2, in the direction of some procedural knowledge to be able to move backwards and influence on how effectively their learning process is working.

REFERENCES

- Al-Otaibi, G.N., 2004. Language learning strategy use among Saudi EFL students and its relationship to language proficiency level, gender and motivation. Doctoral Dissertation, Indiana University of Pennsylvania, Indiana, PA.
- Bedell, D., Oxford, R.L., 1996. Cross-cultural comparisons of language strategies in the People's Republic of China and other countries. In: Oxford, R. (Ed.), *Language Learning Strategies around the World: Cross-Cultural Perspectives*. University of Hawaii, Honolulu, HI, pp. 47–60.
- Bereiter, C., 1995. A dispositional view of transfer. In: McKeough, A., Lupart, J., Marini, A. (Eds.), *Teaching for Transfer: Fostering Generalization in Learning*. Lawrence Erlbaum, Hillsdale, NJ, pp. 21–34.
- Borkowski, J.G., Carr, M., Pressley, M., 1987. Spontaneous strategy use: Perspectives from metacognitive theory, *Intelligence* 11, 61–67.

- Bremner, S., 1998. Language learning strategies and language proficiency: Investigating the relationship in Hong Kong. *Asian Pacific Journal of Language in Education* 1 (2), 490–514.
- Cummins, J., 1979. Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. *Working Papers on Bilingualism* 19, 121–129.
- Diab, R.L., 2000. Political and socio-cultural factors in foreign language education: the case of Lebanon. *Texas papers in Foreign Language education* 5, 177–187.
- Ehrman, M., Oxford, R.L., 1989. Effects of sex differences, career choice, and psychological type on adult language learning strategies. *Modern Language Journal* 73, 1–13.
- Garcia, E.E., 2005. *Teaching and Learning in Two Languages: Bilingualism and Schooling in the United States*, Teachers College Press, New York.
- Grainger, P.R., 1997. Language-learning strategies for learners of Japanese: Investigating ethnicity. *Foreign Language Annals* 30 (3), 378–385.
- Green, J., Oxford, R.L., 1995. A closer look at learning strategies, L2 proficiency, and gender. *TESOL Quarterly* 29 (2), 261–297.
- Griffiths, C., Parr, J.M., 2001. Language-learning strategies: Theory and perception. *ELT Journal* 53 (3), 247–254.
- Holec, H., 1981. *Autonomy and Foreign Language Learning*. Pergamon Press, Oxford.
- Horwitz, E.K., 1987. Surveying student beliefs about language learning. In: Wenden, A., Rubin, J. (Eds.), *Learner Strategies in Language Learning*. Prentice/Hall International, Englewood Cliffs, NJ, pp. 119–129.
- Keene, E.O., Zimmermann, S., 1997. *Mosaic of Thought*. Heinemann, Portsmouth, NH.
- Mansanares, L.K., Russo, R.P., 1985. Language learning: Learning strategies used by beginning and intermediate ESL students. *Language Learning* 35 (1), 21–42.
- O'Malley, J., Chamot, A., 1990. *Learning Strategies in Second Language Acquisition*. Cambridge University Press, Cambridge.
- O'Malley, J.M., Chamot, A.U., Stewner-Manzanares, G., Russo, R.P., Kupper, L., 1985. Learning strategy application with students of English as a second language. *TESOL Quarterly* 19 (3), 557–584.
- Oxford, R.L., 1990. *Language Learning Strategies: What Every Teacher Should Know*. Heinle and Heinle, Boston, MA.
- Oxford, R.L., 1993. Instructional implications of gender difference in language learning styles and strategies, *Applied Language Learning* 4, 65–94.
- Oxford, R.L., Burry-Stock, J., 1995. Assessing the use of language learning strategies worldwide with the ESL/ EFL version of the strategy inventory of language learning (SILL). *System* 23 (1), 1–23.
- Oxford, R.L., Ehrman, M., 1995. Adult's language learning strategies in an intensive foreign language program in the United States. *System* 23 (3), 359–386.
- Oxford, R.L., Nyikos, M., 1989. Variables affecting choice of language learning strategies by university students. *The Modern Language Journal* 73 (3), 291–300.
- Paris, S., Lipson, M., Wixson, K., 1994. Becoming a strategic reader. In: Ruddell, R., Ruddell, M., Singer, H. (Eds.), *Theoretical Models and Processes of Reading*, fourth ed. International Reading Association, Chicago, pp. 788–810.
- Park, G.P., 1997. Language learning strategies and English proficiency in Korean University. *Foreign Language Annals* 30 (2), 211–221.
- Phillips, V., 1991. A look at learner strategy use and ESL proficiency. *CATESOL Journal* (Nov), 57–67.
- Pintrich, P.R., Garcia, T., 1994. Self-regulated learning in college students: Knowledge, strategies, and motivation. [Online]. Available from: <http://ccwf.cc.utexas.edu/~tgarcia/p&gpub94pl.html>.
- Politzer, R., 1983. An exploratory study of self-reported language learning behaviors and their relation to achievement. *Studies in Second Language Acquisition* 6, 54–65.
- Politzer, R., McGroarty, M., 1985. An exploratory study of learning behaviors and their relationship to gains in linguistic and communicative competence. *TESOL Quarterly* 19, 103–124.
- Reid, J.M., 1987. The learning style preferences of ESL students. *TESOL Quarterly* 21, 87–111.

- Rubin, J., 1987. Learner strategies: Theoretical assumptions, research history and typology. In: Wenden, A., Rubin, J. (Eds.), *Learner Strategies in Language Learning*. Prentice/Hall International, Englewood Cliffs, NJ, pp. 15–30.
- Sheorey, R., 1999. An examination of language learning strategy use in the setting of an indigenized variety of English. *System* 27, 173–190.
- Shmais, W.A., 2003. Language learning strategy use in Palestine. *TESL-EJ* 7 (2), 1–17.
- Siebert, L., 2003. Student and teacher beliefs about language learning. *The ORTESOL Journal* 21, 7–39.
- Stern, H.H., 1975. What can we learn from the good language learner? *Canadian Modern Language Review* 31, 304–318.
- Tran, T.V., 1988. Sex differences in English language acculturation and learning strategies among Vietnamese adults aged 40 and over in the United States. *Sex Roles* 19, 747–758.
- Wenden, A., Rubin, J. (Eds.), *Learner Strategies in Language Learning*. Prentice/Hall International, Englewood Cliffs, NJ, pp. 103–118.
- Wharton, G., 2000. Language learning strategy use of bilingual foreign language learners in Singapore. *Language Learning* 50 (2), 203–243.
- Yang, N.D., 1999. The relationship between EFL learners' beliefs and learning strategy use. *System* 27, 515–535.

Kenocod: A New Kind of Quizzing Tool for Game-Based Learning in Coding Interview Preparations

Vinodh Kumar SUNKARA

vk.86.811@gmail.com

Susmitha SUNKARA

sunkarasusmitha6@gmail.com

Jyothsna TALACHUTTLA

jyothsna964@gmail.com

ABSTRACT

With an increase in candidates preparing for software job interviews and a downfall in classroom learning techniques, there is a demand for game-based learning apps in software job interview preparations. There are many existing coding websites like Codechef, HackerRank, Codeforces, Leetcode, etc. but with three major drawbacks. First drawback is that it's difficult for users to take up a coding problem with enthusiasm, spend hours long brainstorming, code and submit the solution. Second is with remembering the solution after solving it and to revise quickly the attempted problems. Third is with interlinking all possible ways of solving a problem. All three issues are handled in the design of Kenocod. The work "Kenocod" is a portmanteau of "key notes" and "codes". Kenocod has Quiz and Mindmap features which incorporate salient points about coding problems and solutions. Kenocod installs seeds of coding concepts in users brains through it's new kind of quizzing mechanism. Kenocod quiz question contains coding problem and a partial solution, users are expected to fill the gaps by selecting appropriate answer choices while learning concepts in depth using web links attached to the answer choices. Quiz questions also gamify keywords like Binary Search, Bit Manipulation, Dynamic Programming etc. to interlink and tag different ways of solving a problem. The solution of coding problems associated with attempted quiz questions are stored as mindmaps in the best possible representation for the users to easily remember and revise, along with the java code git links. Quiz questions and mindmaps are in different formats like flowchart, pseudo code, math formulaes, key points and diagrammatic representations depending on the coding problem. Kenocod is implemented using Meteor, an open source Javascript framework written in Node.js and same Javascript code base is used to run the Meteor app on web or on iOS and Android devices. Amazon S3 and MongoDB are usage for storage. Heroku is used to launch the initial prototype as a web app <http://kenocod.herokuapp.com#!/home>

Keywords:Kenocod, Coding Interviews, Software Job, Game-Based Learning, Quizzing Tool, Educational Technology

INTRODUCTION

Researchers surveyed 2,000 individuals in Canada recently and studied the brain activity of 112 others using electroencephalograms. According to their study, the average human attention span has fallen from 12 seconds in 2000 to eight seconds. This is mostly due to the impact of growth in mobile phones usage. Heavy users of technology face difficulty in environments where prolonged attention is needed, especially classrooms and work meetings. Also, a study by Microsoft found that the ability of humans to multi-task has increased. The cost of development for games has reduced due to increase in toolkits and game engines in market. There is a significant growth in number of designers and developers looking for challenges. This has lead to a significant rise in game-based learning techniques that keep learners engaged compared to passive learning techniques. Digital games are now being used to teach alphabets and numbers to babies, patients to track their health numbers, military to develop strategic and practical skills, software skills to engineers, improve order placing pace in restaurant customers, learn first aid techniques, math skills to high school students, 3-Dimensional learning in classrooms, financial derivatives to auditors etc.

There are different games in market with different agendas as shown in Figure 1. McDonald's launched a till training game that delivers engaging learning experience to improve customer's ability to take orders and using questions to assess knowledge on how to deliver the best customer experience. The Resuscitation council launched an interactive training LifeSaver to make aware of basic steps to respond in cases of cardiac arrest. Medieval Swansea is a game to solve historical mysteries by giving the player a role of detective. Knowre is a personalized supplemental program for Geometry and Algebra for students. Socrative is a fun app for effective classroom engagement through quizzes, polls, exit tickets etc. There are not many games to prepare for software job interviews in a right way. There are apps like geeksforgeeks, leetcode, careercup etc. but they are less motivating to follow on a daily basis and very content heavy apps. The volume of questions listed and verbose solutions make it less motivating to follow these apps for fun. Direct employment in software industry increased from 778,000 jobs in 1990 and 1,083,000 jobs in 1995, to 2,095,000 in 2010 and 2,501,000 in 2014. As per U.S. Bureau of Labor statistics, demand for software developers will increase from 28% to 32% by 2020. With a huge growth in candidates preparing for job interviews and an increase in mobile phone users, there is a good demand for game-based learning apps on mobile for software job interview preparations. Teaching the standard problems and different ways to solve them in classrooms or online tutorials is very time consuming and less motivating for screenagers, also likely to forget the core algorithms involved in the learning while at testing environment with pressure. Showing simulations for algorithms is more interesting than tutorials but it does take it's own time to understand and motivate oneself to gather attention. It's also difficult task to simulate all standard interview problems and solutions, only a few standard algorithms' simulations are available on web currently. Game-based learning involves the candidates to the best in learning process, making it involuntary to record in brains all standard techniques to be applied in the interview room.

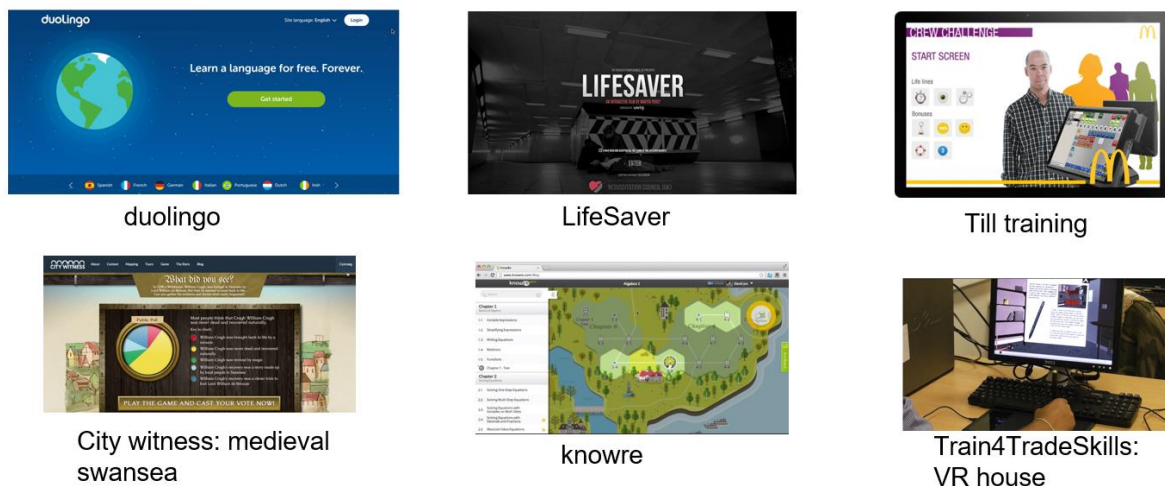


Figure 1: Game-based learning apps in market for different fields

CHALLENGES OF GAME-BASED LEARNING

There are different challenges and principles in game-based learning compared to the traditional training through lectures, online tutorials and hands-on training. The authenticity of material that's targeted to deliver through game should be preserved rather than overloading fun to justify the gaming conventions and result in inauthentic material conveyed through the game. Prior knowledge on the material learnt can help or hinder learning. Individual with right knowledge in prior will have an upper hand and the ones learnt in prior in wrong ways face hard time during learning process. For example, a new truck driver can play loading dock games to improve his skills on real field. If the driver had prior experience to load dock in less crowded areas, it's much likely to develop tendency to ignore the rear obstacles. In a passive learning environment, this side-effect from prior learning comes out and get caught only in testing arena, whereas in a game-based learning the driver fails first with virtual setup before he gets on real field. Game-based learning imposes sufficient practice on the players to get right answers and scores, thereby making them perfect with the material.

This practicing of material is in general boring to do in classroom or self-motivated environment, but in a game it's mandatory to reach next level passing easier versions by playing required number of times till they succeed. This facilitates learning in bite-sized chunks by making seekers perfect with easier chunks delivered first and throw tougher challenges in the game eventually. The constant feedback delivered in the game helps learner to fail faster and avoid silly mistakes in testing environment. A subset of real environment features is provided as part of game material. The insignificant details are ignored in the game, preparing for potential mistake corrections and eradications when the material learnt through game is applied. The simulation game to learn car driving will focus on steering controls, gears, brakes, etc. main functions rather than how to remove car back seats or change seat covers.

CODING INTERVIEWS AGENDA

There are different rounds of interviews at most of the companies like Google, Microsoft, Facebook, etc. Each round falls under one of the following categories: Phone interview, Remote screen share, lunch, on-site, etc. The mindset of interviewee and interviewer varies with respect to each category, especially with the imposed time bound for each interview round. Phone interviews expect to test the quick-witted responses with limited coding. Lunch interviews tend to go over insightful discussions on different ways to tackle a problem and non-technical questions. Remote screen share sessions are generally scrupulous, having an access to compile and run the codes. On-site interviews are all-inclusive with whiteboard coding generally and they are the final decision points. Keeping in mind these diverse interview rounds, it's important for candidate to interlink different ways of solving problems and thorough understanding of concepts. There are multiple interviewers involved in the complete process and everybody has their own expertise. Interviewers may expect the candidate to come up with solution for given problem using their techniques of interest. Each interview round is lengthy enough for interviewer to discuss around the candidate's suggested solution and contrast with alternate ways. Kenocod design for quiz includes a set of questions which tag different keywords using concepts like data structures, time complexities etc. related to the coding question along with reference to online links for deeper study.

Traditional coding interview preparations are mostly self-guided and involves coding on Integrated Development Environments (IDEs). It takes a lot of effort and time to solve a single question and distracts the candidate from focussing on uber picture. Candidates tend to prepare within comfort zone of IDE beautifications and syntax corrections. It's very likely to forget the logic and algorithm behind first question one solved after writing codes and debugging to get them work for tens of problems as part of interview preparation. Interviewers either adopt the standard questions from web or design their own questions. Few interviewers ask questions which may have chained problems. On a day-to-day process at work, employers need their developers to estimate, assess, design, build and coordinate. It's easy to test these different aspects with chained questions where a question innately leads to another, the next one often an uninterrupted exploration of same theme but much deeper. It's a very even transition since the problem is already constructed in candidate's mind and interviewer can explain further challenges with less effort and lays a clear-cut path to study one's capabilities. It's very helpful to have a broad view on related problems and extensions for a given problem while preparing for coding interviews. Kenocod is designed to have quiz questions with different variations, interlinks between concepts and web links as reference to answer choices.

Interview calibrations play pivotal role in candidate's selection process. A question is well calibrated based on what it reveals about interviewee, how well it juxtaposed candidates' performances and correlations of different solutions to real potential. Interviewers might ask standard questions or modifications of existing web questions, but most of them would be asking new-to-them questions where interviewers likely refer to web solutions to compare with candidate's. One going with fixed mindset and single way of solving problem would face different results in calibrations from different interviewers. Interviewers are advised to maintain records of every interview, sometimes it's quite handy to take second opinion from other team members showing candidate's performance. Records generally include pictures of codes, diagrams, pseudo-codes, etc. from interview session. Playing on Kenocod will give good insights into different variations of each problem and avails practise on various aspects of it to the candidate. Kenocod quizzes also act as mock interviews to the candidate which is much suggested by all researches about coding preparations.

Asking questions to the interviewer is also advised by researches before diving into solution. It's easy to ask which data structure to pick or which way to solve when the candidate has a comprehensive understanding of the coding problem and solutions. There are different approaches candidate can follow while coming up with solution. One can write examples and generalize into proper solution, see what problems it's similar to and modify the algorithm, modify given problem by changing constraint to simplify, solve and generalize the solution, aim from base cases and build on top of them for complete solution and also an intuitive way to start with data structures brainstorming and relate it to problem suggested on solution eventually. All these approaches are considered while designing the kenocod quiz questions and mindmaps.

COMPETITORS IN MARKET

Figure 2 has different coding platforms in market for software job interview preparations. Codingame is an innovative code learning platform where logic behind each exercise is tied to an actual game so that the gamer/coder gets the visual feedback as well as the reward for solving an exercise. The company targets people who are already good at programming basics and has tough challenges for expert developers. They have multiplayer mode to compete on code efficiency and support coding in 23 different programming languages. They have browser based IDE where we can code and compile, while seeing the game in real time on screen's corner. For example, a game of fighter killing aliens coming nearer. The code challenge is to find the nearest alien always to shoot first. User is expected to write code, compile and visualize it on game. Codechef is a programming contest platform with contests that are comprised of easy, medium, hard and challenge question lists. A coder picks question of his choice, codes the solution and uploads it. Codechef compilers judge if it's a successful submission and notes the run time. Most questions have an editorial to refer solution if unable to solve by oneself. Codechef contests include a long challenge, cook-off and lunchtime challenges varying on number of questions and days of challenge. Pex for fun from Microsoft Research is a game where we write C#, VB or F# programs and explore from browser directly. It also allows users to play coding duels where they compete to discover a secret puzzle implementation. Rankk is another website with challenges that target user to climb up in a ranking pyramid. Each pyramid level offers questions spanning topics like arithmetics, programming, cryptography etc. The game is designed in a way that journey to top of the pyramid is arduous with much tougher questions higher in level.

SPOJ is an online judge system with hundreds of thousands of registered users and thousands of problems. It's tasks are prepared by a designated community or picked from earlier programming contests. SPOJ allows advanced users to conduct contests under their own rules and has a forum where programmers can discuss how to solve a particular problem. SPOJ acts as an automated evaluator for programs and also an online platform to help users understand how to solve problems and compare solutions. HackerRank is another place to solve problems in varied Computer Science domains such as algorithms, machine learning or artificial intelligence, and to practise programming paradigms like functional programming. They provide interesting experience with boilerplate code and animations that display while running code. They do have a community to discuss and compete with. HackerRank scores carry value on Resume to represent coding talent and contests supply candidates in job recruiting. Users can win cash prizes at HackerRank challenges and also become paid contributor by creating own challenges. Topcoder is considered the most traditional platform within the competitive coding community. They host fortnightly online competitive programming contests known as SRMs (Single Round Matches). They provide a coding arena using Java applet unlike other platforms like SPOJ, Google Code Jam, Codeforces etc. with ACM-ICPC model where problems are solved on local computer by users and upload source code for judging. There are websites like Leetcode, GeeksforGeeks, InterviewBit etc. where users write and compile code on online IDEs. The number of total problems on these websites vary and the experience is appreciated by different users differently as per one's preference and compatibility with the frameworks.

Quizful is a website for interactive programming quizzes and learning computer science theory. Exercism is a platform with exercises on more than 30 programming languages integrated with github. Exercises in exercism are fetched using command line client, solved using favorite editor and submitted through command line for review feedback. There are many other coding websites like Codility, CodeEval, Codewars, Fightcode, Coderbyte etc.

There are also books like “Cracking the Coding Interview” by Gayle Laakmann and “Algorithms for Interviews” by Adnan Aziz. There are sites like Stack Overflow and StackExchange to discuss software development and programming questions. Programming puzzles and codegolf stack exchange is a question and answer site for programming puzzles and code golfers expecting the solution to be in fewer bytes of source code.

All the coding practise websites like codechef, leetcode, topcoder etc. among above resources are interesting and challenging but expect good amount of time to be spent with them in coding and doesn't offer a solid revision and consolidation mechanism. Kenocod is not a full stretch coding platform design but a high level layer on top of it. Coders who finish coding from all these websites can come to Kenocod for practising content. It works vice-versa where users of Kenocod dive into the background of coding problem and solution using reference links attached in answer choices to the above websites' solution archives. The quiz and programming puzzle websites in the above resources like quizful, rankk etc. target mostly the language specific questions and general puzzles but not in depth coding interview preparation focussed. Kenocod quiz design involves questions of different types as per the programming question model to provide right mind maps to revise and remember content for experienced coders, and to incite interests for newbies through seeds of concepts with web links attached to answer choices as reference. Kenocod design includes questions with answer choices as keywords picked from concepts like trees, linkedlist, stacks, backtracking, bit manipulation, dynamic programming etc. related to the coding problem. Few questions involve pseudo code completion where missing pieces of pseudo code are picked from answer choices and a few questions involve flowchart completion. Some quiz questions include common formulas and one-liners that represents heart of solution within answer options. Another set of questions are about rearranging jumbled lines of pseudo code that complete solution. One or few of these design types are picked per-problem basis to come up with most efficient quiz question that incites users to learn more and remember logic for revision. In next version, the game also encourages users to come up with own quiz question suggestions for a better mindmap of solution which will be cited with their user name once it's approved to be added as part of the game.



Figure 2: Coding platforms in market for software job interview preparation

KENOCOD DESIGN

Kenocod app has the following components:

1. Signup and login widget
2. Home page
3. Begin Quiz Page
4. Mindmaps Page
5. Scores Page
6. Help module

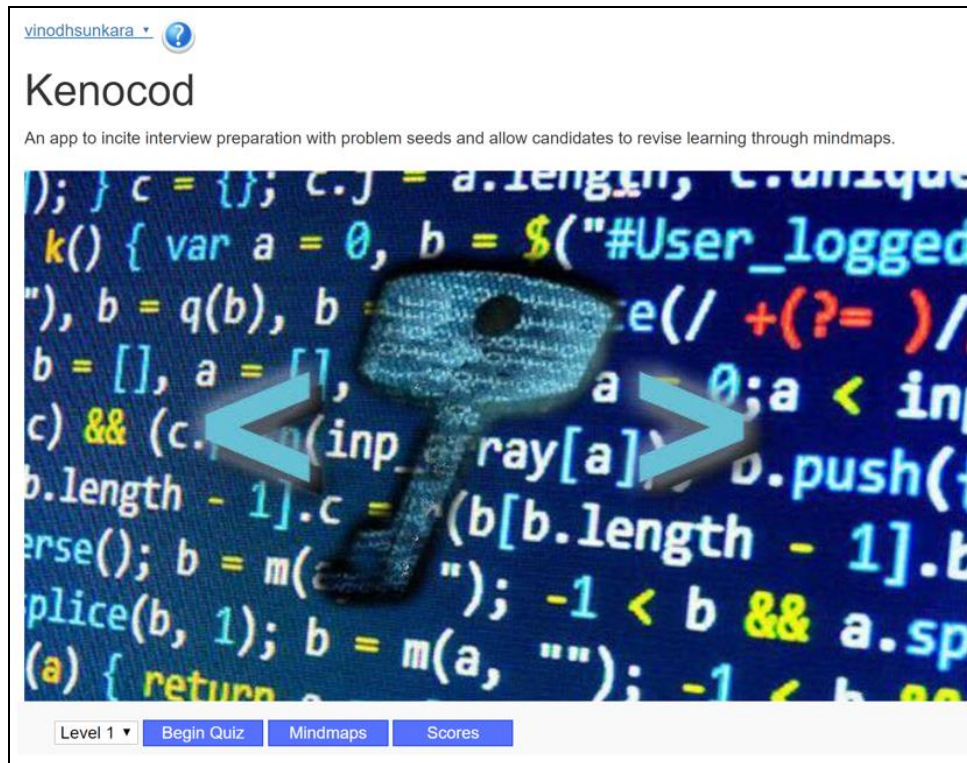


Figure 3: Kenocod home page

Kenocod contains a signup and login widget, with username as unique login ID. The home page has a logged out view with Kenocod Description, Logo, Help Module and Signup/Login widget. Figure 3 has the signed-in view of home page which contains links to Begin Quiz page, Mindmaps page, Scores Page, Help Module and Logout button. The Help Module contains instructions on how to use the app. The 'Begin Quiz' button launches the quiz. Quiz has different types of questions depending upon the category of the coding problem. Each quiz question has the coding problem statement and a partial solution in different formats. The user would have to pick the appropriate answer choices that fills the gaps in solution. The partial solution in quiz question comes up in different formats like pseudo code, flow chart, representative diagram, etc. The easy and medium difficulty level questions are in level 1 set of quiz content and Level 2 has the difficult questions. Difficulty is in terms of solution complexity and also the complication in framing quiz question out of it. The 'Mindmaps' page contains all attempted quiz questions by the user with best possible representation of the complete solutions for the problems, facilitating easy revision of content for users. There is a Scores page that displays kenocod stars with all top scorers in descending order on scores. Each quiz game has ten questions each and a feedback module gives the number of correct and wrong answers at the end of quiz submission.

Each Kenocod quiz question is designated internally by a JSON object with a few of following parameters:

- qText: Quiz question text explaining the coding problem
- qImg: If quiz question has an image to detail, this takes Amazon S3 url for the image
- qSolText: Partial solution text for coding problem corresponding to the quiz question
- qSolImg: If partial solution has an image, this takes Amazon S3 url for it
- ansAText, ansBText, ...so on: Text explaining answer choices to fill gaps in partial solution for coding problem referred in quiz question
- ansAImg, ansBImg, ...so on: If the answer choices contain images, these are Amazon S3 urls
- ansARef, ansBRef, ...so on: Web reference links attached to quiz answer choices
- qSolFullText: This is the text explaining the complete solution for coding problem in easy to remember/revise format, used for mindmaps

- qSolFullImg: This is the image explaining the complete solution for coding problem in easy to remember/revise format, used for mindmaps
- oneans (boolean): True if quiz question has single answer, False if quiz question has multiple options
- qRightAns: Contains a string of right answer options separated by a comma, used in feedback module at the end of each quiz session
- optcount: Count of total answer options for tool internal usage in code base
- qCodeLink: git code link attached with mindmap corresponding to coding problem referred in quiz question

Figure 4 has a sample kenocod question format:

```
"3": {
  "qText": "Find element that appears more than n/2 times in array of size n",
  "qSolText": "Choose all applicable options to solve this",
  "ansAText": "Brute force, check for each element: Time Complexity O(n)",
  "ansBText": "Use hash table to maintain counts of each element: Time Complexity O(n^2)",
  "ansBRef": "https://gist.github.com/amadamala/3cdd53cb5a6b1c1df540981ab0245479",
  "ansCText": "Brute force, check for each element: Time Complexity O(n^2)",
  "ansDText": "Use hash table to maintain counts of each element: Time Complexity O(n)",
  "ansEText": "Can be solved using Bit manipulation",
  "ansERef": "https://en.wikipedia.org/wiki/Bit_manipulation",
  "ansFText": "Optimized solution's time complexity O(n)",
  "qSolFullImg": "https://s3-us-west-2.amazonaws.com/kenocod/L1_q3_sol_full.png",
  "qCodeLink": "https://github.com/vinodhsunkara/mindmaps_codes/tree/master/L1_3",
  "qRightAns": "c,d,e,f",
  "oneans": "false",
  "optcount": "6"
},
```

Figure 4: Kenocod internal quiz question format

KENOCOD IMPLEMENTATION

The leading platforms for mobile apps are Android and IOS with a market share of around 80% and 15% respectively. Android apps can be built using android studio with Java programming and IOS apps can be developed using Swift programming language. Kenocod is decided to be built on framework where a single code base should power the app to run on both iOS and Android devices. Meteor, or MeteorJS, is a free and open-source JavaScript web framework that is written using Node.js. It is a full-stack JavaScript platform for developing modern mobile and web applications. It includes a major set of technologies for building connected-client reactive applications, a build tool, and a curated set of packages from the general JavaScript community and Node.js. Meteor allows to develop in one language, JavaScript, in all environments like application server, web browser, and a mobile device. Meteor uses the data on wire i.e. the server sends data instead of HTML, and the client renders it. Meteor brings the best parts of the active JavaScript community in a considered way. Meteor provides the full stack reactivity, allowing user interface to smoothly reflect the true state of the world with less development effort. Heroku is used to generate the Meteor web app url <http://kenocod.herokuapp.com/#!/home>. Kenocod will also be deployed as Android and iOS apps after adding 300+ coding problems to the quiz. Heroku is a platform as a service that allows developers to build, run and operate the applications in cloud completely. Kenocod uses Amazon S3 as a CDN to store all images and MongoDB to store the data like Scores and other user meta data.

KENOCOD MINDMAPS

Mindmaps page contains the best possible representations for the solution of coding problems corresponding to quiz questions attempted by the user. This page helps users to revise all attempted questions multiple times very quickly during coding interview preparations. The git links attached to mindmaps contain git links with complete working java code that can be used as a reference. In general, each model of coding problem contain multiple questions and mindmaps use similar format for users to remember easily the core logic. For example, there are different problem variations using sliding window on an array.

One of them is to find array of Max's, where Max is a maximum element within window at each step of a sliding window (size k) moving one step at a time left to right on an array (size n). Figure 5 shows the quiz question corresponding to this problem. The key points of solving problem are using Deque interface and maintaining Window invariant as the window moves step by step on the array. The definitions of poll, pop etc. are also important when LinkedList data structure is used to implemented the Deque. Quiz question is framed on top of these key notes to solve the problem. Ref links are attached to a few answer choices for users to learn in detail the concepts involved in solving the problem. In this problem, Deque interface and methods involved is a good learning and there is Ref link attached to option b. Once user attempts this question in one of the quiz sessions, the Mindmaps page contains an entry corresponding to the quiz question as shown in Figure 6. The key points are highlighted in the mindmap. The window invariant “Head of queue is maximum always” is mentioned and a window queue with commands used to add and remove elements from head and tail of queue are represented pictorially. A few steps how to maintain window invariant are also added to mindmap along with git link with complete java code. This format is used in all sliding window problems and easy to remember/revise for users after learning while playing quiz using problem seeds or pointers to concepts involved. Another example is a Dynamic Programming problem where the basic step is to fill a 2D table with values while solving the problem. This is explored while designing quiz questions and mindmaps for dynamic programming problems. Figure 7 shows a mindmap for a quiz question related to dynamic programming problem to find the length of longest palindromic subsequence.

Given an array of size n and a sliding window of size k moving one step from left to right. Return the array of maxs, where max is a maximum element within window at each step

Description:
Choose all applicable options to solve this

Answer Choices:

- ☐ a: Window invariant is: Maximum element within window is arithmetic mode of all window elements
- ☐ b: Dequeue interface is very helpful to solve this compared to Stack [Ref](#)
- ☐ c: Window invariant is: Maximum element is always head of queue
- ☐ d: A single stack is more powerful to solve this than queue/dequeue
- ☐ e: poll retrieves and removes head/first element of list, offer adds element as tail/last element of list
- ☐ f: poll retrieves and removes tail/last element of list, offer adds element as head/first element of list

Figure 5: Sliding window problem - Kenocod quiz question

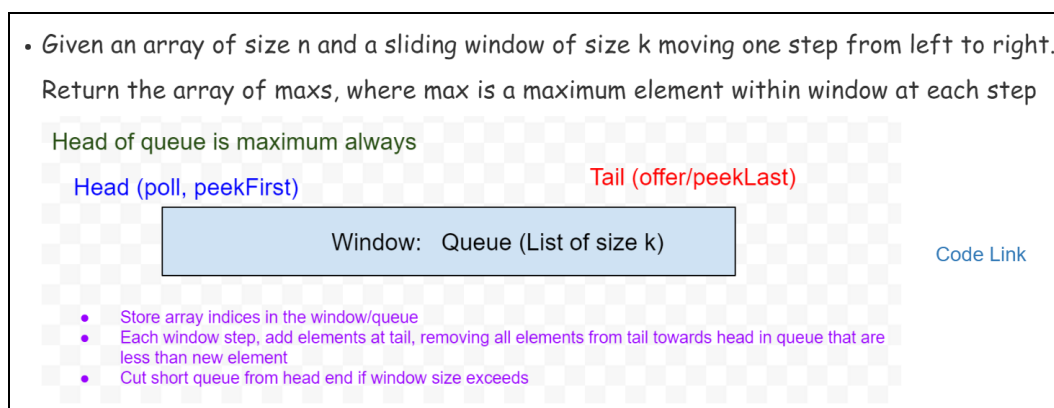


Figure 6: Sliding window problem - Kenocod Mindmap

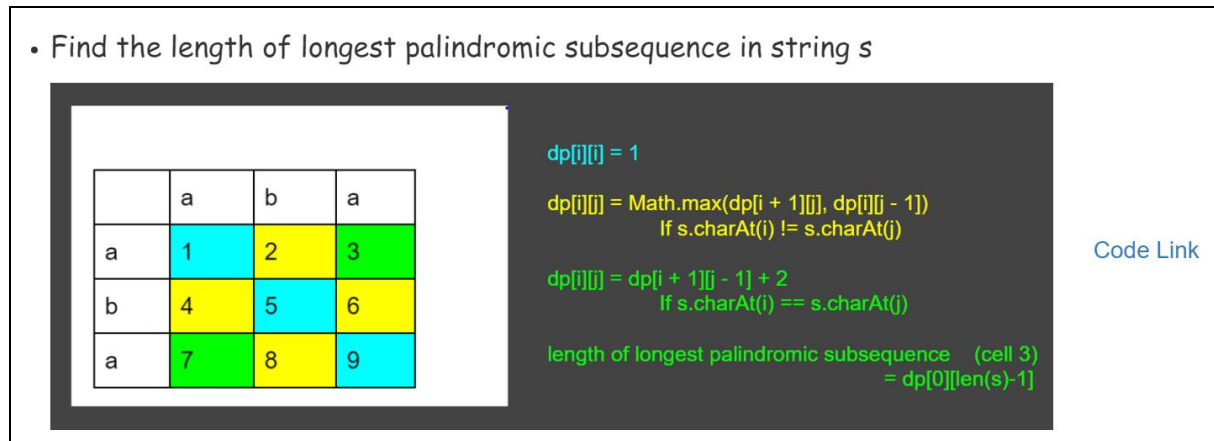


Figure 7: Dynamic Programming problem - Kenocod mindmap

CONCLUSION

Kenocod is a very helpful tool for many industry programmers and fresh college graduates who have a tough time preparing for coding interviews to join or change a software job. It's a common problem to forget most of it that's learnt before interviews. It's also confusing and less motivating to pick a question and solve from the huge pool of coding problems on web. Kenocod helps with all needed pointers to concepts involved in solving a coding problem, referred in this paper as problem seeds using the quiz questions. Mindmaps act as revision guide with the best possible representations of coding problem and it's solution. Kenocod is aimed for a launch on iOS and Android devices once 300+ quiz questions are added to the app. Web app with Kenocod prototype is available at <http://kenocod.herokuapp.com/#!/home>.

ACKNOWLEDGEMENT

Thanks to GeorgiaTech OMSCS EdTech course members of Spring 2017 semester for giving feedback on the initial tool prototype.

REFERENCES

- Business Insider, <http://www.businessinsider.com/ios-and-android-dominate-marketshare-2016-2>
 CodeChef, <https://en.wikipedia.org/wiki/CodeChef>
 CodeGolf, <http://codegolf.stackexchange.com/>
 Codingame, <https://www.codingame.com/home>.
 Exercism, <http://exercism.io/>
 HackerRank, <https://www.hackerrank.com/>
 LeetCode, <https://leetcode.com/>
 Marc, Prensky. (2001). Digital Game-Based Learning. McGraw-Hill
 Meteor, <https://www.meteor.com/>.
 Quizful, <https://quizful.com/landing>
 Robert, J. (2014). The U.S. Software Industry: An Engine for Economic Growth and Employment. SIIA.
 TopCoder, <https://www.topcoder.com/>

Language Teacher Training Program Evaluation Using a Mixed Method: A Case Study of a Korean in-Service Teacher Training Program

Yoonhee CHOE

Department of English Education, Chongshin University, Seoul, Korea
yhchoi@csu.ac.kr

ABSTRACT

This study investigates a Korean in-service teacher training program evaluation using decomposition modeling (Borich & Jamelka, 1982). Inputs, constraints, and expected outcomes of the program were identified at the initial stage of the program evaluation. The program was evaluated using a mixed method involving quantitative and qualitative data analysis methods. For the quantitative method, the outcomes of the program were measured. Qualitative data analysis using the constant comparative method led to the emergence of several themes. The program evaluation using a mixed method provides some methodological and policy implications for teacher training program developers and evaluators.

INTRODUCTION

Foreign language teacher training programs have attracted the interest of many participants, program developers, and governments worldwide. Particularly, the Ministry of Education in Korea has initiated and developed various kinds of English language teacher training programs to enhance Korean teachers' English proficiency skills. Over the decades, these programs have developed from domestic-only and short-term study abroad programs to domestic and study abroad combined programs that maximize the program effects. Some studies have evaluated the outcomes of teacher training programs (Chang, Kim, & Jung, 2011; Ha, 2009; Kim & Ahn, 2011; Kim, Kim, Lee, & Woo, 2010; Na, Ahn, & Kim, 2008). However, most previous studies have focused on quantitative data collection and analysis rather than qualitative data analysis (Allen, 2002; Collentine & Freed, 2004; Dewey, 2004; Díaz-Campos, 2004; Dufon & Churchill, 2006). Furthermore, recent previous studies conducted tended to overlook the participants' developmental process in teacher training programs and their linguistic, affective, and identity changes over the course of the program. In order to evaluate language teacher training programs more thoroughly, programs should be described and analyzed in more detail involving sub-activities, resources, and goals (Choe, 2013; 2016). Researchers need to capture the organization of a program and how program activities are used to achieve program goals by analyzing the program in greater detail. Otherwise, program evaluation cannot identify the strengths and weaknesses of the program and propose improvements. Thus, this study aimed to address gaps in the previous literature by investigating a case of a Korean in-service language teacher training program evaluation that used a mixed method. This study analyzed the Korean in-service teacher training program using the decomposition model (Borich & Jamelka, 1982) and applied a mixed method to investigate the participants' developmental process in the program. This study conducted a small-scale longitudinal ethnographic investigation of the outcomes, experiences, and perspectives of program participants. The following research question was posed: how can the Korean in-service language teacher training be decomposed for evaluation using a mixed method?

THE STUDY

Program decomposition

The Korean in-service language teacher training investigated in this study was designed to address the needs of Korean teachers of English. The program aimed to provide the following: English language instruction, an orientation to aspects of American culture, instruction on the most current communicative teaching techniques, and the development of lessons and curriculum with special attention to the actual curriculum the teachers needed to use in their home country.

The first step of program evaluation was program decomposition. The purpose of decomposing a program is to indicate explicitly the activities that will occur as students progress through the program (Borich & Jamelka, 1982).

Program decomposition allows members of the program, such as administrators, instructors, participants, parents, and students to understand the questions and concerns that may represent conflicting or compatible interests. A program can be conceptually demonstrated through a series of diagrams. In the first-level diagram (see Figure 1), a box represents the main activity of the Korean in-service language teacher training Program aiming to develop Korean English teachers' communicative competence and teaching English in English (TEE) ability, and to help Korean teachers of English achieve a TEE certificate validating their TEE capability.

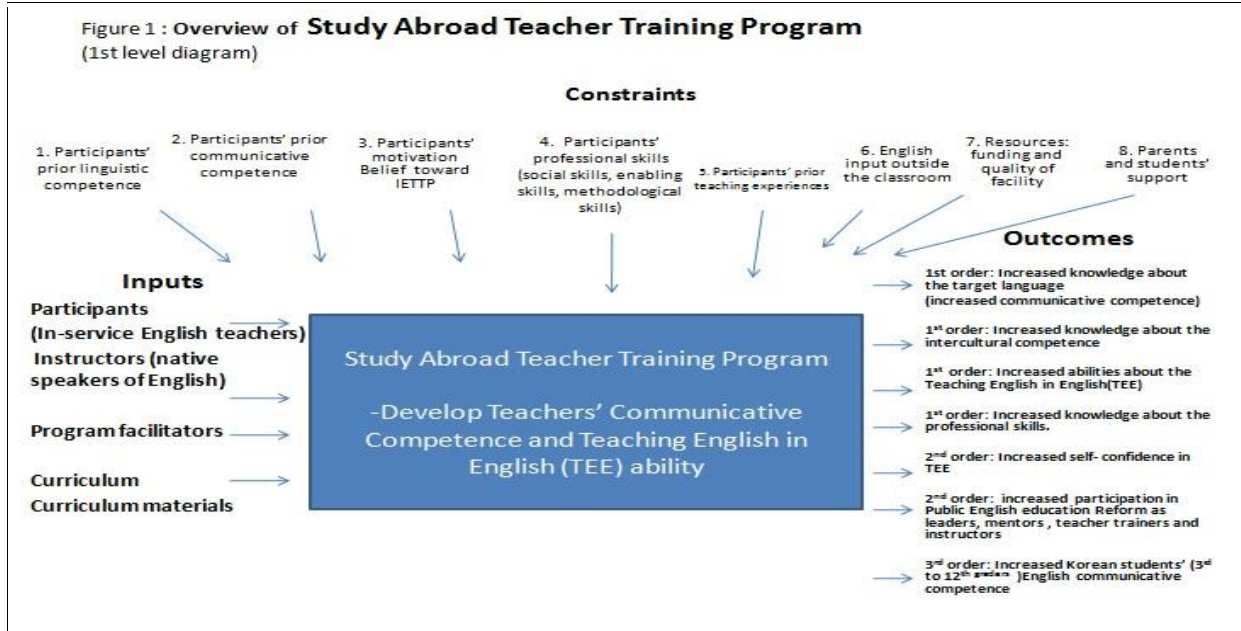


Figure 1: Overview of Study Abroad Teacher Training Program

Prior to decomposition, the inputs, constraints, transactions, and outcomes of the program should be defined and identified. Inputs refer to the activity of the program; changing program participants; as well as staff, facilities, and materials required by the program. Constraints are aspects that moderate or influence the activity or its outcomes that can be measured in degrees on a continuum. Funding, opportunity for practice, organizational climate, and skill levels of trainers are examples of system constraints. Feedback on performance and participants' prior achievements can be program constraints. Outcomes are behaviors resulting from the activity. Participants with a certain skill level can be an outcome. Outcomes need to be realistic and representative. First-order outcomes, which are closer to the program objective, should be used to indicate the program's effectiveness. Second- or third-order outcomes can be used to indicate the overall direction of the program. Transaction is a planned unit of program activity that has a measurable outcome. Enabling outcomes are behaviors produced by a transaction that are prerequisite to subsequent transactions and the attainment of terminal outcomes. Terminal outcomes are behaviors that the program participant is expected to exhibit at the completion of all program transactions (Borich & Jamelka, 1982). The inputs, constraints, and outcome designations reveal how activities or transactions within a program are closely connected.

The inputs of the program under evaluation were participants, instructors, program facilitators, and curriculum materials. The program had several constraints. The primary constraint was the participants' initial English proficiency level at the beginning of the program. The other constraints were the participants' motivation, foreign language anxiety, beliefs about the Korean in-service teacher training program, and foreign language inputs outside the classroom. The quality and quantity of the language contacts with native speakers were another important constraint. The participants' personality and their intercultural sensitivity and available resources may have been constraints as well.

The first-order outcomes were participants' increased English communicative competence, increased intercultural competence, increased TEE skills, and increased knowledge about professional skills such as presentation skills and computer-literacy skills.

The second-order outcomes were participants' increased self-confidence in TEE skills and increased participation in public English education reform movements as leaders, teacher trainers, mentors, and instructors. Ultimately, as a desired outcome, the third-order outcome would be increases in Korean secondary school students' English communicative competence if taught by teachers who undertaken this study abroad teacher training program. The transactions or activities in this program were as follows: teaching communicative language skills, teaching methodologies, and practicing skills to TEE, developing professional skills, practicing teaching practicum in a real classroom, and participating in a project conference.

FINDINGS AND DISCUSSION

The Korean in-service teacher training program was decomposed to identify its structure, graphically outlining the salient characteristics of the program (Figure 2).

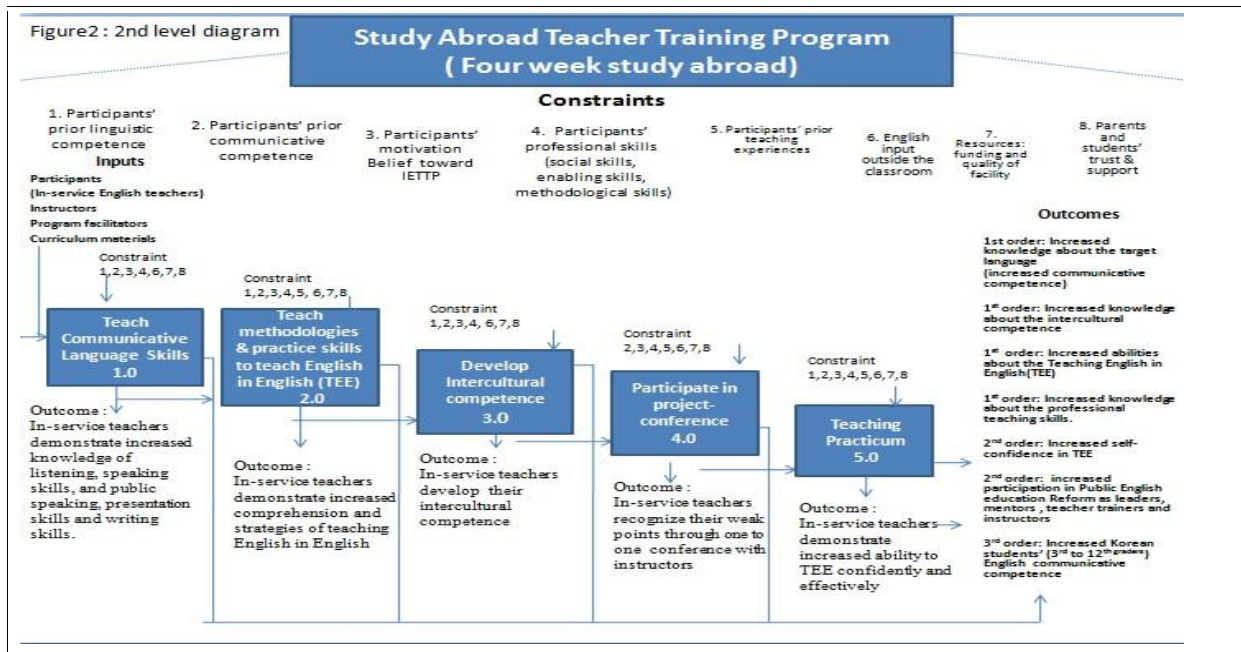


Figure 2 Program Decomposition of Study Abroad Teacher Training Program

Some natural language questions were considered in the program evaluation. Natural language questions are potential questions by stakeholders and variables that need to be measured. Stakeholders are individuals or groups and institutions who affect or are affected by a program's actions, decisions, and performance (Borich & Jamelka, 1982). Weiss (1983) defined stakeholders as group members affected by the program and those who make decisions about a program. Korean teachers of English who were participating in this study abroad teacher training program and native English-speaking instructors were identified as the primary stakeholders. Additionally, administrators, directors, and program sponsors of this program were classified as stakeholders.

According to Borich and Jamelka (1982), stakeholders raise a series of natural language questions about the overall cost and effectiveness of the program. First, Korean teachers can ask natural and apparent language questions such as the following, "Will this program help me improve my English communicative competence?" Variables to be measured to answer the question are overall English proficiency, oral and written fluency, accuracy, and complexity. The instruments to measure the above variables can be formal standardized tests such as TEPS or TOEFL, students' daily entry journals for assessing their writing performance, and oral interviews for assessing their oral fluency and accuracy. For analyzing the data, descriptive analysis was used, and the participants' initial language proficiency scores (the entrance test scores) and posttest scores (the exit scores) were compared.

The second natural language question was "Will the program help me improve my teaching English in English (TEE) ability?" One measure that could be used to answer this question was classroom management skills in English. Qualitative analysis was used to examine the participants' TEE skill improvement.

The third natural language question was “After completing this program, can I apply what I’ve learned into my classroom?” A variable that could measure this question is the ability of participants to communicate effectively in English. I used a self-assessment of English skills as the measurement instrument. A descriptive analysis of the results of these self-assessments was conducted to understand the applicability of the in-service study abroad teacher training program. In addition, the data elicited from the focus group interviews were used to group the common themes and identify the relationship among the themes.

The development of the participants’ TEE ability was one of the most important objectives of the study abroad teacher training program. The Ministry of Education in Korea has aimed to strengthen the Korean Public English education by training Korean English teachers to develop their communicative competence and TEE ability. Korean public English education is expected to further strengthen by training English teachers. Program evaluation could contribute to meeting social and parental needs, maximizing the cost effectiveness of the program, and making better decisions in the future about Korean public education.

In this program evaluation, a mixed method, including qualitative and quantitative data analysis, was applied. For formal assessment of the participants’ English proficiency, a web-based pretest at the beginning of the program and a posttest at the end of the program were administered. With regard to speaking, each participant was interviewed by native English-speaking instructors. With regard to writing, they were asked to write an essay on one of several topics for half an hour. Their interviews and essays were assessed by their native English-speaking instructors using holistic rubrics. Their interviews were collected thrice—during the study abroad program, at the beginning of the program, in the middle of the program, and at the end of the program on a volunteer basis.

For qualitative research, the participants’ journals, reflection papers, and interviews were collected. The interviews were semi-structured in order to include certain preselected themes. In the initial interview, participants were asked about their prior travel and language learning experiences, their reasons for applying for the study abroad teacher training program, and their expectations about the United States. Midterm interviews elicited a description and evaluation of the experience, including daily routines, questions about social contacts, and comments about this program. In the final interview, the participants were asked to evaluate the experience in its entirety and to comment on the extent to which it matched their initial expectations. They were asked to characterize their English language development and motivation for continued study (Kinger, 2008, 2009). In addition, the interviewers asked the participants to comment on their relationships to the experience. In their journals, the participants were asked to write a minimum of one entry per week recounting any events they judged relevant to their language learning. Participants were also provided with calendar dairies in which they recorded detailed information about their language use at three specific points during the study abroad. Additionally, the participants’ journals and writing assignments were collected every week and analyzed to measure the changes in their intercultural sensitivity, their affect such as their motivation and anxiety, and their perception of themselves as teachers of English.

The participants’ dailies entries, reflection papers, interview data, and my ethnographic field notes were transcribed, coded, and analyzed qualitatively. In addition, a few participants were interviewed after they had returned home to examine changes in their teaching and motivation or foreign language teacher anxiety.

All the qualitative data including interview transcripts and the participants’ reflection papers were collected, analyzed, and interpreted based on the constant comparative method of grounded theory (Strauss & Corbin, 1998), which is commonly used for analyzing, coding, and interpreting data in qualitative research. Several themes were identified from the data of the interviews, field notes, and participants’ daily journal entries. One theme was increased awareness of cultural and linguistic differences. Another theme was the participants’ increased intercultural competence. Some aspects of these themes are quite similar to previous findings on the topic (Heather Allen, 2010; Allen & Herron, 2003; Jackson, 2008; Aveni, 2005; Dufon & Churchill, 2006).

These qualitative results revealed how the participants’ motivation changed over the program, the developmental process of the participants’ intercultural competence, and dynamic nature of language learning experiences in a study abroad teacher training program. In addition, it was revealed that the participants’ experiences were related to their identity formation and language learning in the study abroad program. Using the mixed method, many significant themes that were overlooked by some previous language program studies were identified and investigated thoroughly.

According to Royse, Thyer, Padgett, and Logan (2001), evaluation researchers have begun to employ ethnographic fieldwork in educational contexts with the primary aim of better understanding the learning processes of participants in a particular program. This approach in this program evaluation was particularly useful in a small program in which the researcher could gather ethnographic data while developing a close relationship with participants (Royse et al., 2001). This approach enabled me to identify subtle aspects of the program that would have been missed by forms of evaluation that focus exclusively on outcomes. Using this ethnographic approach in my study helped me understand how participants develop linguistically, affectively, and interculturality.

Another significant advantage of this process-oriented evaluation was that the participants were continually encouraged to reflect on their language and cultural learning, including both positive and negative elements (Choe, 2012; Dufon & Churchill, 2006; Freed, Dewey, Segalowitz, & Randall, 2004; Paige, Cohen, Kappler, Chi, & Lassegard, 2002). Overall, integrating qualitative and quantitative methods allowed me to perceive the detailed aspects of this program holistically and provide some pedagogical implications for maximizing the effectiveness of study abroad teacher training programs (Kiely & Rea-Dickins, 2005).

CONCLUSIONS

This study evaluated a Korean in-service English language teacher training program using a mixed method. The mixed investigation method provided extremely useful information that had been overlooked by previous product-oriented language program evaluations. The data analysis using the mixed method focused on the process of the participants' developments. Thus, the program evaluation revealed the linguistic, affective, and intercultural changes in participants over the program. To overcome the limitations of the previous literature, future research can apply this mixed method using various instruments such as formal language assessment, self-assessment, and semi-conducted interview protocols. Furthermore, the decomposition method that analyzed the program prior to its evaluation was descriptive and informative. However, this study has some limitations. One limitation is that after-program effects were not investigated in this study. This study does not discuss how the participants changed after the program and how this program influenced participants' linguistic competence, affects and TEE skills in their teaching practices (Heather Allen, 2010). Future research can focus on investigating after-program effects for a more reliable and useful teacher training program evaluation for program developers. Despite these limitations, this study also provides methodological and policy implications.

This study was conducted with various kinds of research methods to investigate the in-service teacher training program within more detail. I used ethnographic observation and data collection to obtain a more in-depth program description and to investigate how, when, where, and what the participants experienced. For trustworthiness, I used triangulation, including member checking, to ensure that what I interpreted was in line with what the participants meant. To measure the validity of the qualitative data, I met some of the Korean teachers after program completion, presented my findings, and asked them if these were similar to what they remembered of their experiences. They confirmed my findings and added more detailed interpretations to my findings.

The mixed method using both quantitative and qualitative methods was well designed for investigating the study abroad teacher training program with its dynamic and intertwined interactions between participants and local people. The feedback by participants provided insights for study abroad in-service teacher training programs in a manner that quantitative research cannot.

In terms of the efficiency and effectiveness of time and funds, the effects of this program appeared to be similar to those of domestic programs. However, what the participants learned, felt, and experienced significantly exceeded their expectations. Therefore, policy makers should be aware of the underlying critical effects of study abroad in-service teacher training programs and attempt to adapt these benefits when they plan domestic programs or future study abroad teacher training programs.

ACKNOWLEDGMENTS

I am grateful to Gary Borich, Diane Schallert, Elaine Horwitz, Thomas Garza, and Orlando Kelm for their support and guidance in this research. This article is based on my Ph.D. dissertation study. Parts of the article were presented at the International Teacher Education Conference 2017 at Harvard University in Boston, MA.

REFERENCES

- Allen, W. [Heather]. (2002). *Does study abroad make a difference? A study of motivational and linguistic outcomes* (Doctoral dissertation). Retrieved from Dissertation Abstracts International. (63, 1279).
- Allen, W. [Heather]. (2010). Language learning motivation during short-term study abroad: An activity theory perspective. *Foreign Language Annals*, 43(1), 27–49.
- Allen, Q. [Linda]. (2010). The impact of study abroad on the professional lives of world language teachers. *Foreign Language Annals*, 43(1), 93–104.
- Allen, H. & Herron, C. (2003). A mixed methodology investigation of the linguistic and affective outcomes of summer study abroad. *Foreign Language Annals*, 36(3), 370–385.
- Aveni, V.P. (2005). *Study abroad and second language use*. Cambridge University Press.
- Borich, G.D., & Jamelka, R.P. (1982). *Programs and systems: An evaluation perspective*. New York: Academic Press.
- Chang, K.S., Kim, C.Y., & Jung, K.T. (2011). The effect of intensive in-service teacher education on the English teachers' professional development and instructional behavior. *English Literature Education*, 17, 219–245.
- Choe, Y.H. (2012). The intercultural competence and language learning of Korean EFL teachers during overseas training. *Foreign Languages Education*, 19(4), 1–25.
- Choe, Y. H. (2013). A critical review of research on language learning abroad: Its themes and methods. *English Language Teaching*, 25(1), 1–24.
- Choe, Y. H. (2016). The influence of a study abroad teacher training program on the language development of Korean teachers of English. *The Journal of Asia TEFL*, 13(1), 31–47. <http://dx.doi.org/10.18823/>
- Collentine, J., & Freed, B. (2004). Learning context and its effects on second language acquisition: Introduction. *Studies in Second Language Acquisition*, 26(2), 153–171.
- Dewey, D. P. (2004). A comparison of reading development by learners of Japanese in intensive domestic immersion and study abroad contexts. *Studies in Second Language Acquisition*, 26(2), 303–327.
- Diáz-Campos, M. (2004). Context of learning in the acquisition of Spanish second language phonology. *Studies in Second Language Acquisition*, 26(2), 249–273.
- Dufon, M.A., & Churchill, E. (2006). *Language Learners in Study Abroad Contexts*. Clevedon: Multilingual Matters.
- Freed, B., Dewey, D., Segalowitz, N., & Randall, H. (2004). The language contact profile. *Studies in Second Language Acquisition*, 26(2), 349–356.
- Ha, M.A. (2009). *The effect of intensive in-service teacher education on English teachers' professional development and instructional behavior* (Unpublished doctoral dissertation). Korea National University of Education, Cheongju.
- Jackson, J. (2008). *Language, identity and study abroad: sociocultural perspectives*. London: Equinox.
- Kiely, R. & Rea-Dickins, P. (2005). *Program evaluation in language education*. Palgrave Macmillan.
- Kim, J.W., & Ahn, K. (2011). Evaluation of an intensive English teacher training program: An investigation of teacher learners' perceptions and development. *Studies in English Education*, 16(1), 213–244.
- Kim, S.Y., Kim, H.R., Lee, S., & Woo, K.J. (2010). Effects of long-term intensive teacher training program from elementary and secondary teachers perspectives. *English Teaching*, 65, 199–224.
- Kinginger, C. (2008) Language learning in study abroad: Case studies of Americans in France. *The Modern Language Journal*, 92 (s4), 1–124.
- Kinginger, C. (2009). *Language Learning and Study Abroad*. Palgrave Macmillan.
- Na, Y.H., Ahn, B.K., & Kim, H.S. (2008). Evaluating an in-service English teacher training program from multiple perspectives. *English Teaching*, 63(4), 273–302.
- Paige, R., Cohen, A., Kappler, B., Chi, J., & Lassegard, J. (2002). *Maximizing Study Abroad: A Student's Guide to Strategies for Language and Cultural Learning and Use*. Minneapolis, MN: Center for Advanced Research on Language Acquisition.
- Royse, D., Thyer, B., Padgett, D., & Logan, T. (2001). *Program evaluation: an introduction*. Belmont, CA: Wadsworth/ Thomson Learning.
- Strauss, A.L., & Corbin, J. M. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd Ed). Thousand Oaks, CA: Sage Publications.
- Weiss, C. H. (1983). The stakeholder approach to evaluation: Origins and promise. *New Directions for Program Evaluation*, 1983(17), 3–14.

Learning by Designing: Investigating New Didactic Methods to Learn Architectural Design

Giuseppe FALLACARA

Dipartimento di Scienze dell'Ingegneria e dell'Architettura

Politecnico di Bari

Italy

giuseppe.fallacara@poliba.it

Maurizio BARBERIO

Consorzio Argonauti

Politecnico di Bari –

Università degli Studi Roma Tre

Italy

maurizio.barberio@uniroma3.it

Micaela COLELLA

Consorzio Argonauti

Politecnico di Bari –

Università degli Studi Roma Tre

Italy

micaela.colella@uniroma3.it

ABSTRACT

The paper aims to investigate the experiential learning approach applied to the teaching of architectural design in university courses. The introduction of IT tools in architecture in the last decades, has introduced new questions in how to teach the computer-aided architectural design to students and how to use these tools properly. Among these themes, parametric design tools have become relevant for many researchers and designers around the world. This paper aims to describe how to provide students the critical tools to use the new parametric design softwares consciously, showing also the results of the students' research projects for the 3rd year Architectural Design Course. As mentioned before, the course is set on learning by doing and experiential learning didactic paradigms. In the first semester, the students were asked to imagine new complex stereotomic vaulted systems using parametric softwares. In the second semester, following the latest developments in sustainable architecture, the students were asked to imagine and fabricate reactive devices in order to design smart building envelopes, through dynamic sunlight filtering. At the end of the year, the students were able to use the skills developed during the whole year, designing a more complex architecture, like an innovative high school.

Keywords: Experiential Learning, Learning By Doing, Design Studio Pedagogy, Digital Design, Fabrication Laboratory

BACKGROUND: INFORMATION TECHNOLOGY AND DESIGN STUDIO PEDAGOGY

The introduction of IT tools in design can be traced back to 1959 when General Motors starts an experimental project to digitize, store and print the many design sketches generated by the various departments of the company. The project will later lead to the development of DAC-1 - Design Augmented by Computer, in collaboration with IBM. In the mid-sixties, Ivan Edward Sutherland (1964) during his doctorate at MIT, develops Sketchpad, a computer program which is considered as precursor for modern CAD systems and the starting point for computer graphics. The program was the first to use a graphical user interface (GUI), a display, and an optical pen. Inspired by Sutherland's work, a few years later, Eric Teicholz developed GRASP at Harvard's Graduate School of Design, a program that already developed a generative-like system. In 1977, William J. Mitchell published the book "*Computer aided-architectural design*", providing a comprehensive introduction to the fundamentals of computer-aided architectural design for the students of architecture, the architect in practice, and the computer professional who is interested in learning about this application area (Mitchell, 1977). In 1981, IBM produces the first personal computer, named PC 5150. In 1984, Apple released the Macintosh, the first personal computer with a fully graphical user interface. In 1982, Autodesk releases AutoCAD, the first computer-aided design software; in 1985 Microstation and the first version of ArchiCad have been released. In the nineties at Columbia University in New York, the "paperless studio" were created by Greg Lynn, Hani Rashid and Scott Marble. Already in 1988, Robert Dvorak, in a paper titled "*Designing in the CAD Studio*" describes a completely electronic environment where students are called to use the computer as the only design tool (Dvorak, 1988).

Since the nineties, architects like Greg Lynn and NOX begin to explore the use of software with the intention of creating new design processes, no longer using the software as a means to carry out a project that could be achieved in other ways, but using the software itself as a design tool. Towards the end of the eighties, Frank O. Gehry also began experimenting with a “paperless” approach to the design and construction of architecture. In 1992 the studio designs a fish-shaped pavilion to be placed on the Barcelona's seafront. The three-dimensional computer model was derived from a physical maquette. The surface thus generated was then refinished in order to carry out structural analyses. The production and assembly of the structural components were completely directed from the digital model (Naboni & Paoletti, 2015, p. 8). It is clear how it becomes increasingly important to find the most appropriate strategies for materializing projects developed with digital tools: digital fabrication was born. Between the 1990s and the 2000s, the widespread diffusion of computers in architecture has not only changed the way architects design buildings, but it has also helped to change the way they are built. Branko Kolarevic points out that, following the example of Gehry, architects realized that the information of the digital model could be used directly for manufacture and construction purposes, thanks to the use of numerical control machines (Kalorevic, 2004). A few years before, in 1998, at the MIT, Neil Gershenfeld – director of the “Center for Bits and Atoms” – inaugurated the course called “How to make (almost) anything”. Gershenfeld conceives an interdisciplinary course in which students can learn to use industrial CNC machines to develop fully functioning experimental prototypes. In 2001, the first digital fabrication laboratory (Fab Lab) was created at MIT. Since 2001, the spread of the Fab Labs and the culture of “makers” has grown more and more year by year, changing the teaching methods of architecture, engineering and design schools. Recent publications have been questioned about the future of pedagogy of design studios (Salama & Wilkinson, 2007) and on the relationship between architectural design education, technology of architecture, and information technology (Caneparo, 2007). Other studies have been conducted on the theme of digital architecture as a challenge for design pedagogy (Oxman, 2007) and, more specifically, on comparative evaluation of parametric design systems for teaching design computation (Aish & Hanna, 2017). Finally, other research has been conducted in order to update traditional didactic methods within the fields of digital design and fabrication (Fallacara, 2009).

TOWARD A NEW DIDACTIC METHOD FOR DESIGN STUDIOS

The goal of the research is to overcome the usual didactics of the architectural design studios in Italy, which is basically structured in two parts: lectures and projects reviews. This approach aims to transfer knowledge only according to the tastes and the cultural background of the teachers. Therefore, each teacher transmits its own vision of architecture to his students. In this way, the students are usually forced to adapt their own vision to the preferences of the teacher, studying passively and without involvement (Barberio, Colella, & Fallacara, 2016, p. 585). Thus, since the academic year 2015-2016 (Fallacara, Colella, & Barberio, 2016, p. 28-29), the authors have been investigating a new didactic method for organizing the third year architectural design studios at Politecnico di Bari. The aim is to create a learning process where students are actively engaged; they are required to participate to demonstrate a process, analyse an argument, or apply a concept to a real-world situation. Students are then deliberately “forced” to face uncertain situations, adapt and manage the stress. This allows students to develop their problem solving skills through creativity that is a key part of their job. The current state of the labour market, in fact, requires a considerable capacity to adapt to various changes; consequently, what it really matters is the ability to acquire new knowledge quickly and to use that knowledge to build new skills (Fallacara, Barberio, & Colella, 2016, p. 14-17). This approach has been defined “experiential learning” by the educational theorist David Kolb (1984). This concept was inspired, among others, by the book “*Experience and Education*” (Dewey, 1938) in which Dewey criticizes the traditional teaching methods since knowledge is transmitted exclusively through the books and students are not involved in the learning process. Besides these important concepts, the course also examined learning experiences and perceptions of the flipped classroom model. The forerunner of this new teaching methodology is Professor Eric Mazur from Harvard, who in the book “*Peer Instruction: A User's Manual Series in Educational Innovation*” (Mazur, 1997), outlines some of the key concepts that will influence the flipped classroom learning method, through the development of a didactic strategy called “peer instruction”. With this method, the role of the teacher results radically changed: he guides the students in processing the project critically and actively, encouraging him to face and solve complex tasks.

THE IMPORTANCHE OF A MINDFULNESS DESIGN APPROACH

The third year architectural design course is the time when the basic training of the first and second year needs to mature, both from a practical and critical point of view. After the first two years of undergraduate studies, students start naturally (and hopefully) to develop their own design mentality that, although immature, academics have a duty to direct toward virtuous paths, without censorship and ideological preconceptions.

It is clear that this process can only be implemented if the teachers themselves are able to develop such a mentality. On this subject pedagogues Bauback Yeganeh and David Kolb (2009) have published an article titled “*Mindfulness and experiential learning*”. In this paper, the two authors outline the common aspects between the opening and the mental fullness of the ancient philosophical and meditative practices, known today with the scientific name of mindfulness, and the theoretical pedagogical approach theorized by David Kolb. In particular, the authors compare the characteristics of the mindfulness approach (both meditative and socio-cognitive) and its opposite, mindlessness. By summing up, the first approach, from a socio-cognitive point of view, is characterized by context sensitivity, openness to new information, ability to evaluate multiple perspectives, to be aware of the present moment, to be proactive and non-judging; its opposite is based on the development of a repetitive mentality, which follows predetermined rules without the ability to change them, routinely and, above all, concentrated alternately on the past or the future, without ever focusing on the present moment. Kolb and Yeganeh in their paper have defined the “mindful practices”, which can be summarized in four main points: the development of concrete experiences based on actual reality; the development of reflective observation; the development of abstract conceptualization practices; and, finally, the active experimentation. From an architectural point of view, this may represent a virtuous cycle that begins with the actual reality of architecture (in its formal, material, and symbolic aspects) and returns, after various appropriate reflections and conceptualizations, to the direct and active experimentation for the design of architecture.

The authors believe that overcoming the mindlessness approach is the right way to improve the teaching of architectural design. Indeed, the development of a routine teaching has, as you can imagine, the adverse effects on the student’s development of a free and proactive design culture. Consequently, the student with a still unclear personality, instead of looking for different ways to emerge his unexpressed potential, will end up with passively accepting what his teacher has proposed, with the consequence of extinguishing the possibility of developing a mature and conscious design thinking, based on “learning by designing”. In addition, it is important to emphasize that the architectural project is not only a technical operation aimed at problem solving, but it is also a cultural and critical operation that defines the role of architecture in the society in which we live and the best ways to transform of the built environment. The outcomes of the course, more fully presented in another publication (Fallacara, Barberio, & Colella, 2017), are the result of an approach as much as possible finalized to the conscious development of the students unexplored internal resources for the elaboration of the architectural projects. Thus, doing this through the theme of architecture competition has a dual purpose: 1) first of all, to raise awareness of students about one of the main ways in which architects can contribute to the transformation of society through architecture; 2) secondly, to provide the students the critical and practical tools to develop, from the very start, a design activity parallel to that carried out during academic design studios.

Collecting as many design experiences as possible before graduating, in addition and alternatives to academic projects, is crucial to obtain a better job position after graduation and also to understanding architecture more deeply. After graduation, in fact, students have to deal with the work done up to that point. The feeling of not being ready to face the challenges of the future can be very strong. The risk of not being represented by projects drawn up during university exams is really high, because, as said, design studios are heavily influenced by the teachers. The situation becomes more complicated when students realize that the developed projects are very heterogeneous, as they have been developed by trying to satisfy the “client” of the moment, the professor. At this stage architecture competitions might be a great exercise in order to develop a mindfulness design approach. Thus, participate in architectural competitions in the early stage of the career can be useful for several reasons. For students it is not just an opportunity to expand and enhance their own portfolio, making it more homogeneous and consistent, but it is an incomparable opportunity to explore the unexpressed potential and accepting comparison with other professionals.

ORGANIZATION OF THE COURSE AND DESIGN TOPICS

The course is based on three main interrelated areas: didactics, research and designing. Continuous research and experimentation often lead, at first, into a “dark tunnel” where it is difficult to navigate. Subsequently, the confusion diminishes when mental ideas and images become forms and structure, clearly outlining their constructive potential. In this research process, a path that has never been investigated before is full of uncertainties, especially for a student not yet fully educated. However, getting used to a healthy and controlled risk leads to the development of creative and design skills as a true lever to transform the architecture student into an architect. Getting used to the risk and experimentation raises awareness of the concept of responsibility, inherent in the architectural profession (Fallacara, Barberio, & Colella, 2016, p. 14-17).

The entire annual course is divided into two semesters, conceived to have two key moments: the first half dedicated to learning (knowledge acquiring), and the second half dedicated to the development of the final project (skills development). Basically, the final projects were developed in a relatively short time, from February to May.

The students of the course were divided into project teams of 5-6 people in order to simulate the future professional activity. In fact, it is a common practice that the working groups, even multidisciplinary, work in unison and according to their competences, in order to achieve a common purpose. During the activities of the third year design studio, the authors aimed to transfer to the students the “incomprehensible euphoria” of seeing materializing the design imagined by their minds. A slow and constant maieutic operation, carried out during the weekly reviews, has allowed to students to transfer the project from the world of ideas to materialization on paper and small prototypes (really interesting in many cases), simulating exactly what happens in a professional studio of architecture while participating in an architecture competition.

In detail, in order to make this approach effective, in the first semester of the course students were asked to imagine reactive devices designed to realize a smart building envelope through dynamic sunlight filtering. Therefore, using digital tools (softwares) and analogue tools (*maquettes*), students have developed inedited prototypes of kinetic/responsive architectural modules suitable both for structures and façades. Students were then asked not only to design a device by comparing with new digital software and tools, but also to test the design outcomes at a trial stage where the physical models of the designed elements were produced. Direct experimentation has been preceded by theoretical lectures on the subject, in order to provide significant examples to support the design research work to be carried out. Teachers have also suggested to deepen specific topics when needed to complete the final model during reviews. The results produced are different depending on the creative inclinations of each working group.

In the second semester, instead, students were asked to comply with a call for a design contest. The selected call was the one proposed by the Italian Ministry of Education, University and Research (MIUR), which in 2016 launched a call for ideas in a single phase, with the aim of acquiring project ideas for the creation of innovative schools, from an architectural, technological, structural and antisismic point of view, energetically efficient and characterized by the presence of new learning environments capable of adapting to multiple didactic and functional methods for differentiated activities. The competition involved 52 territorial areas, including the one in the city of Matera for the design of the “Gaetano Briganti” Agricultural Technical Institute, which was chosen as design theme of the course. This choice is dependent on two main factors. The first is certainly linked to the location of the Technical Institute, in the city of Matera, not far from Bari – the city where is located our University (Politecnico di Bari) – within the landscape context between Puglia and Basilicata. Matera was the subject of study and annual theme of the previous Architectural Design Studio in the academic year 2015-2016 (Fallacara, Barberio, & Colella, 2016). The second reason is related to the specificity of the design requirements of the call, which foresees in this case the architectural formalization of two places for the acquisition and transmission of very clear knowledge: the school and the greenhouse: the first place related to the transmission of knowledge and the second to the development of know-how practices, in a constant biunivocal relationship.

OPERATIVE RESEARCH: KINETIC AND RESPONSIVE ENVELOPES AS SUSTAINABLE DEVICES

Since its origins, architecture has been characterized by the presence of stable elements, usually heavy, and moving elements, generally lighter. The first category includes the walls, and second, the windows. In historic building, masonry carried out both the function of structure and building envelope, protecting the indoor ambient from the external variable climatic conditions, while guaranteeing, as far as possible, a constant temperature within the building. Moving and lighter parts, such as windows or covering systems, allowed light and air to penetrate or not into the environments, as needed. This clear distinction is gradually diminished from the widespread diffusion of the framed system, made of reinforced concrete or steel, during the reconstruction after the Second World War. With this system, a supporting skeleton ensures building stability, allowing more freedom for the organization of the interiors. Thus, the thickness of the external infill walls, when not completely replaced by curtain walls, have been progressively reduced. Without having to perform a structural function, the reduced thickness of the infill walls consequently fails to adequately protect the building against the external climatic conditions. Later, the introduction of new heating and cooling systems have permitted of external climatic conditions to be neglected during the design, since internal comfort might be guaranteed through the use of large amounts of energy that in the past was cheap, given the illusion that raw materials such as oil, gas and coal were unlimited. Likewise, the importance of façade openings as a tool for regulating natural lighting and ventilation and as an unparalleled medium of communication with external nature is ignored. However, with the oil crisis in the 1970s, the first steps towards environmental consciousness and the search for alternative energy sources began. These energy crises, in fact, caused the crisis of the development model of industrial civilization and called for reflections and debates on the founding principles of the model, based on the irrational belief that industrial development and demographic growth would be unlimited (Meadows et al., 1972).

The growing environmental sensitivity led to the concept of sustainable development in 1987 (United Nations General Assembly, 1987, p. 16), from which the concept of sustainable architecture is born. For sustainable architecture, light control and natural ventilation have returned to be of fundamental importance. Nevertheless, these aspects are dealt and resolved in a very different way from the traditional architecture. Among the most interesting ways, combined with the use of electricity from renewable sources, there are kinetic façades and responsive surfaces. At the basis of these interactive elements there is a complex system of technologies capable of detecting and processing the data necessary for the realization of movements. The sensors therefore assume great importance: they are devices comparable to nerve endings under our skin, that detect temperature changes and send to the nervous system the information needed to prepare a response. Research on kinetic and responsive façades is a complex issue, whose advancement is largely permitted by projects with very high budgets, or conducted by doctoral or master researches in centres such as the MIT or the University of Stuttgart. Academic or design researches on the subject are based on collaboration with other fields such as information technology, mechanical engineering and physics.

The author's attempt is to introduce these themes at the undergraduate level of studies, i.e. during the first three years of university education. This choice is based on the belief that, albeit limited to the experience of a generalist course such as design studio, it is important to deal with these issues not as end-to-end experiments but as an integral part of a complete architectural design. The course was organized to provide, during the first lessons, the parametric design rudiments, using the parametric deformaters of 3D Studio Max and Grasshopper. Following these introductory lectures, students developed first digital models to familiarize themselves with parametric tools never used before (Fig. 1).

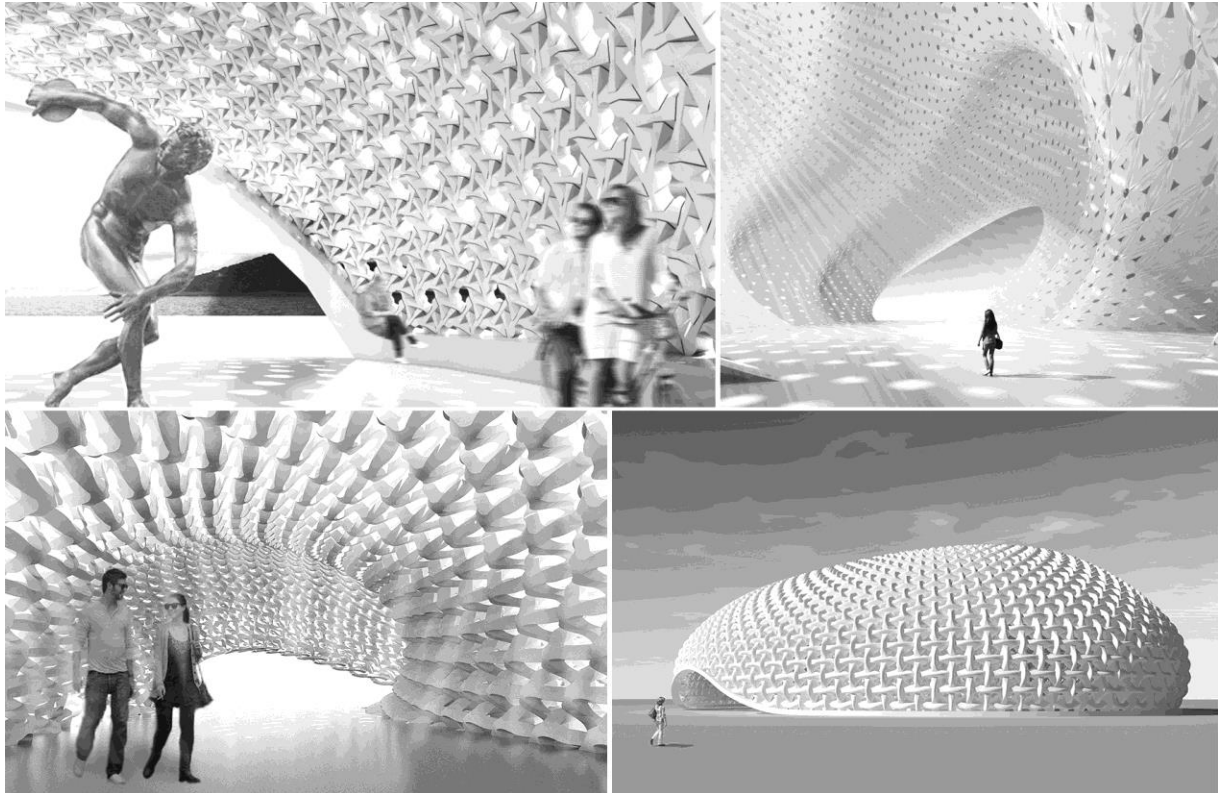


Figure 1: Exercises on the theme of curved morphologies based on parametric deformations. Softwares: 3D Studio Max, Rhinoceros and Grasshopper.

Exercises have revealed a certain degree of difficulty from students in controlling the forms allowed by these softwares and translating design concepts into the reality of construction. This gap is due to an inadequate training that students have on the theme of construction-aware architecture, which the course tries to reduce through a continuous dialogue between teachers and students. These difficulties have been duly taken into account before starting the course, but the experiential approach is valid if the student “faces the crisis” so that the difficulties induced can stimulate the development of problem solving skills.

KINETIC FAÇADES AND RESPONSIVE SURFACES: DIFFERENCES AND SIMILARITIES

Therefore, the control of natural light, indoor temperature and ventilation, is one of the potential of responsive design through which it is possible not only to improve the internal comfort conditions but also the energy efficiency of the architecture, thus reducing the environmental impact. Responsive architecture aims to combine the innovation of new technologies with respect for the environment. The kinetic façades are based on the principle of movement of the shading elements according to the sun position throughout the year, so as to guarantee a high shading during the summer, and an increased penetration of the sun's rays in the winter. As mentioned above, the kinetic façades are characterized by the use of sensors to analyze the external climatic conditions, data processing systems and mechanical devices in order to move the shading elements. The synergistic work of these components makes architecture an adaptive organism, similarly to a living organism. It reacts to the stimuli of external conditions, and from these it must be protected and fed in the same time. A pioneer in this regard is the French architect Jean Nouvel with the project for the *Institut du Monde Arabe* in Paris (1981-1987), one of the most famous architecture featuring kinetic façades (Linn, & Fortmeyer, 2014). Although characterized by principles similar to those of kinetic façades, responsive surfaces are made of a geometric façade pattern consisting of generally small, very thin and light elements, programmed to move in a predetermined direction in response to a stimulus, such as movement, the amount of moisture present in the air and the amount of solar irradiation. The movement of responsive surfaces can be based on the use of active sensors and mechanical elements, as well as on the passive deformation properties of the material, depending on its physical characteristics. On this latter axis are based some researches of Achim Menges (2009) and the Institute of Computational Design and Construction (ICD) of the University of Stuttgart, where the deformation of the responsive elements takes place according to the different amount of moisture present in the air, thanks to the hygroscopic and elastic properties of wood veneer used (Menges, & Reichert, 2015) or materials specially designed for the purpose of being 3D printed (Correa, & Menges, 2015).

OUTCOMES OF THE COURSE: PROTOTYPES AND PROJECTS

As previously mentioned, students were asked: 1) to design a kinetic/responsive devices by using new digital software and tools; 2) to test the design outcomes by fabricating physical models of the designed elements. Thus, all groups were committed to designing a kinetic/responsive devices featuring a more or less complex mechanism capable of ensuring its movement. The design of these devices has been done using three-dimensional (Rhinoceros) and parametric (Grasshopper, SolidWorks) modelling tools (Fig. 2).

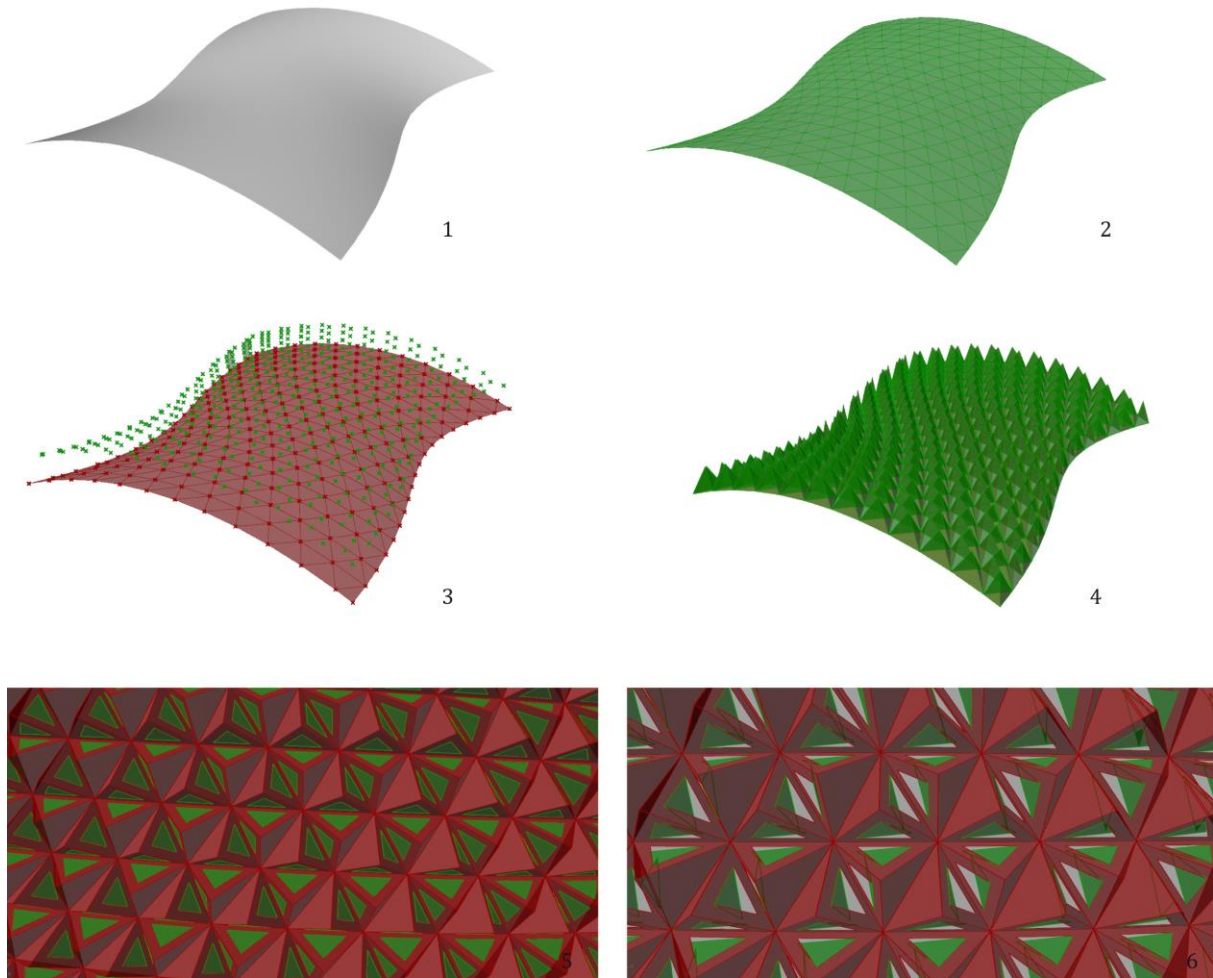


Figure 2: Example of a parametric envelope consisting of kinetic shading elements (students: Bagorda, Benedetto, Calefato, Carbonara, Corigliano, Spaho). Software: Grasshopper.

The specificity of the didactic experience of the course did not require the real implementation of sensors and electronic manipulation mechanisms, fields specifically related to mechanical engineering and electronics. Students have used several digital fabrication techniques, such as 3D printing, laser cutting, CNC milling machines, but also in striving to design mechanisms specifically designed according to different needs. Various materials have been used, including wood, rubber, fabric and paper (Figs. 3-4).

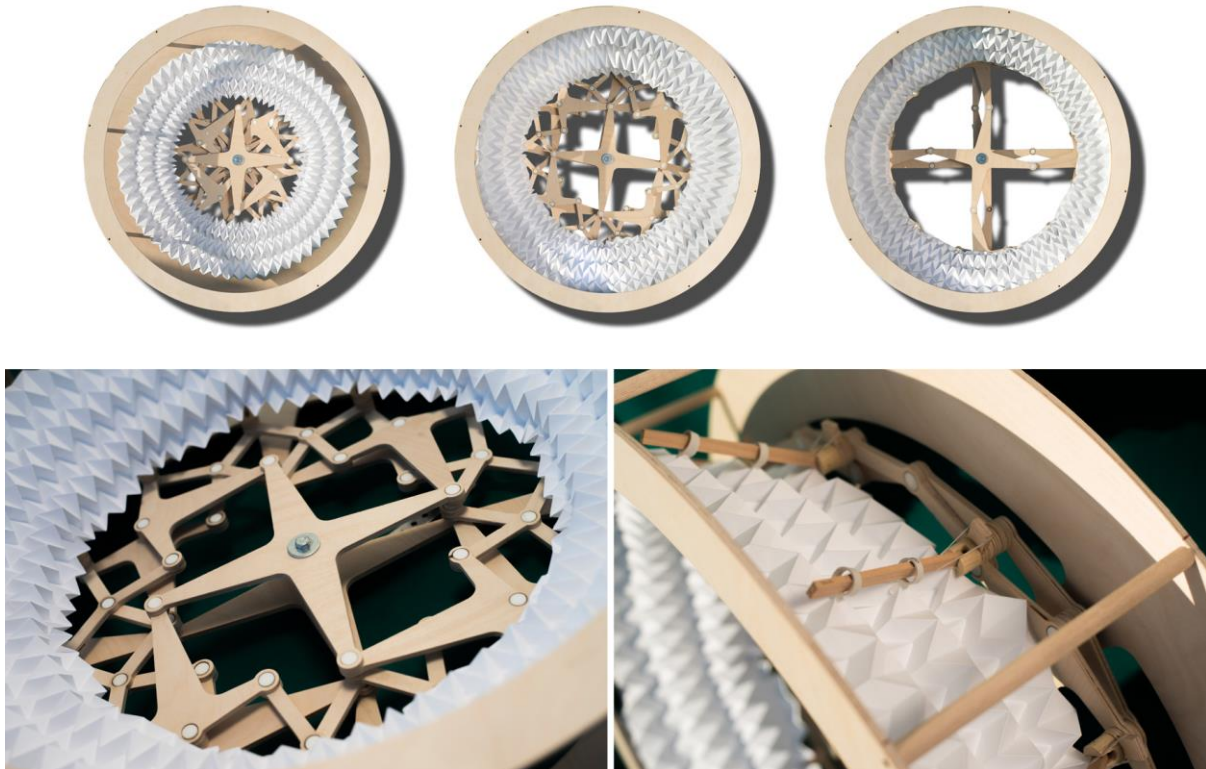


Figure 3: Model of circular-shaped kinetic shading system (students: Cardetta, Maggipinto, Milano, Misto, Pesole, Acet). Software: SolidWorks.

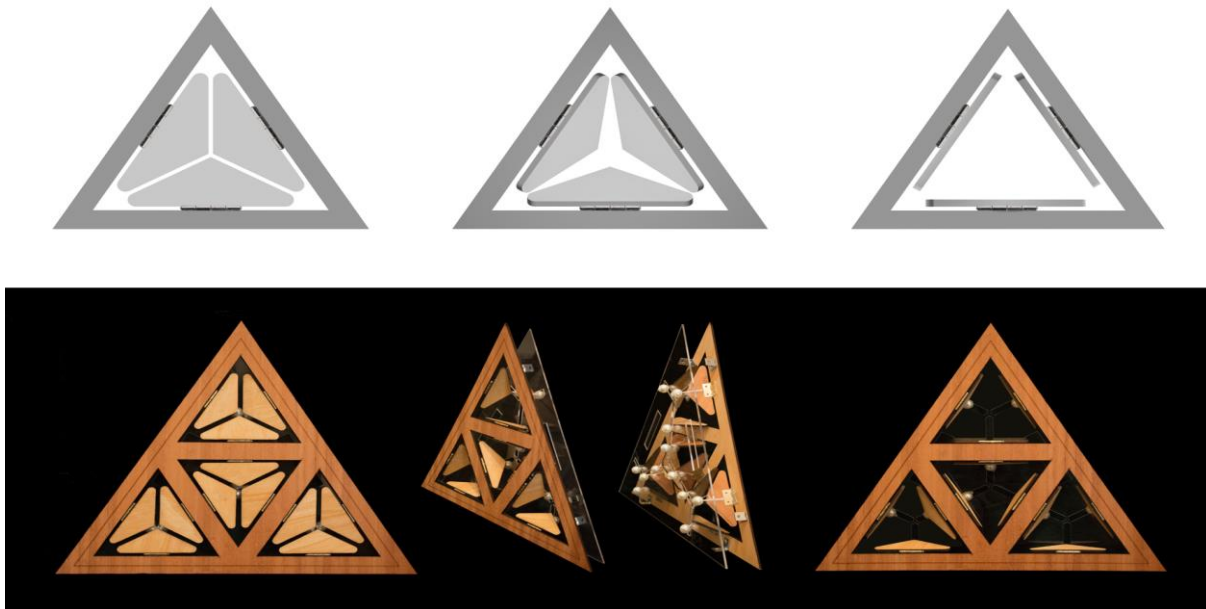


Figure 4: Model of triangular-shaped kinetic shading system (students: Angarano, Curci, Delcuratolo, Herrmann, Porcari, Tarallo). Softwares: Rhinoceros and Grasshopper.

Among the various models developed by students, the most interesting is the model inspired by the researches related to *Bistable Auxetic Mechanical Metamaterials* (Rafsanjani, Pasini, 2016, pp. 291–296), a system based on an evolution of auxetic materials. Auxetics are materials that have a negative Poisson's ratio: when stretched, they become thicker perpendicular to the applied force. Conversely, if compressed, they close, causing a sample restriction. Starting from this research, the group of students aimed to develop a hexagonal façade module, in which the movement of the parts was modulable, reversible and perfectly controllable. The hexagonal module consists of a central core and a frame that encloses it.

The hexagonal central core is geometrically composed of twenty four equilateral triangles, connected to each other at the vertices, through small hinges. The six frame components, one on each side of the hexagon, are further divided into two isosceles trapezoids (Fig. 5).

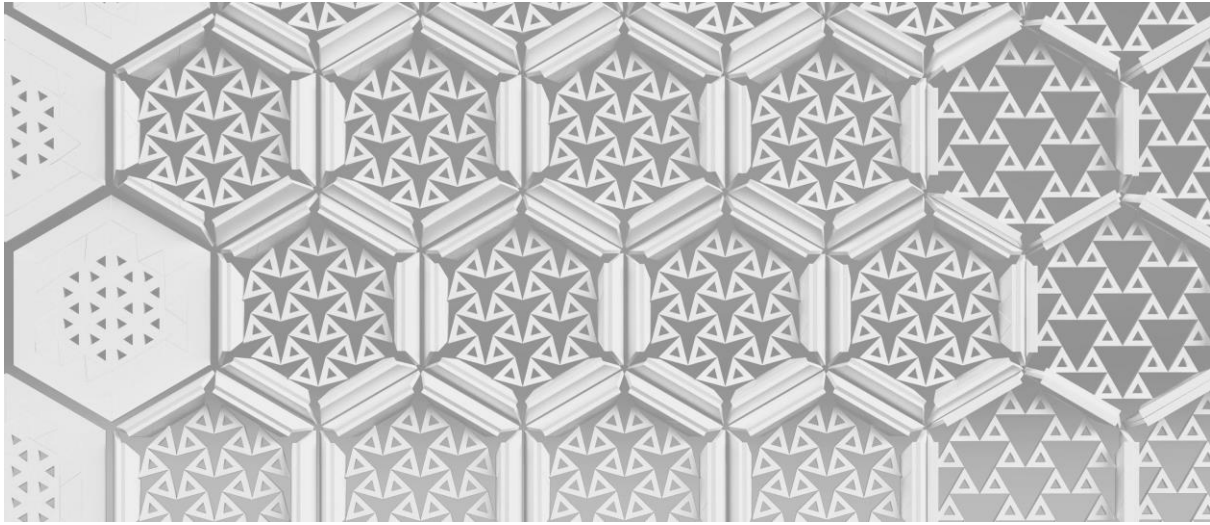


Figure 5: Example of parametric wall obtained with auxetic kinetic pattern (students: Cananzi, Indrio, Ditaranto). Softwares: Rhinoceros and Grasshopper.

The way the triangles are joined together, that is, only through the vertices, allows after the opening to bring them back to the initial position. The movements of the whole pattern is guaranteed by the movement of the parts of the frame to which the triangles are joined: in fact, each of these rotate in such a way that the frame, from a coplanar position to the triangles, assumes an orthogonal configuration, with respect to them, in its final configuration. The triangles, on the other hand, always move on the plane, moving each one according to a different trajectory and rotating up to a maximum of thirty degrees; they, in the open configuration, occupy the space left free from the movement of the frame (Fig. 6).

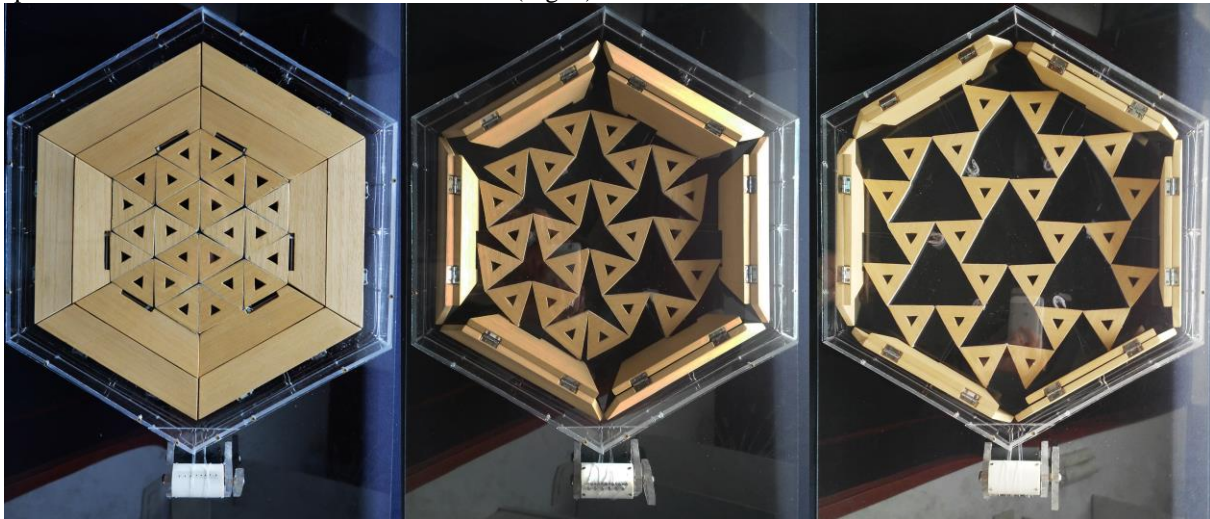


Figure 6: Auxetic kinetic pattern working model (students: Cananzi, Indrio, Ditaranto).

A reciprocal movement is then created: when one part closes leaving space to the other, the other parts open by taking the space left by the first. The movement of the responsive element, in the transition from open to closed configuration, generates other intermediates new patterns, obtaining a dynamic light filtering. The real model is made of wood and uses a system of nylon wires that allow movements. The model was then applied to the final design, in order to create a responsive skin for an innovative school designed for Matera, in the South of Italy (Fig. 7). Other projects are shown in Figure 8; they also use light regulation devices for the design of smart building envelopes. Some of them are used in the design of the greenhouses, to avoid overheating phenomena during the strong irradiation of the summer season.



Figure 7: The project of the school based on the auxetic kinetic façade (students: Cananzi, Indrio, Ditaranto).

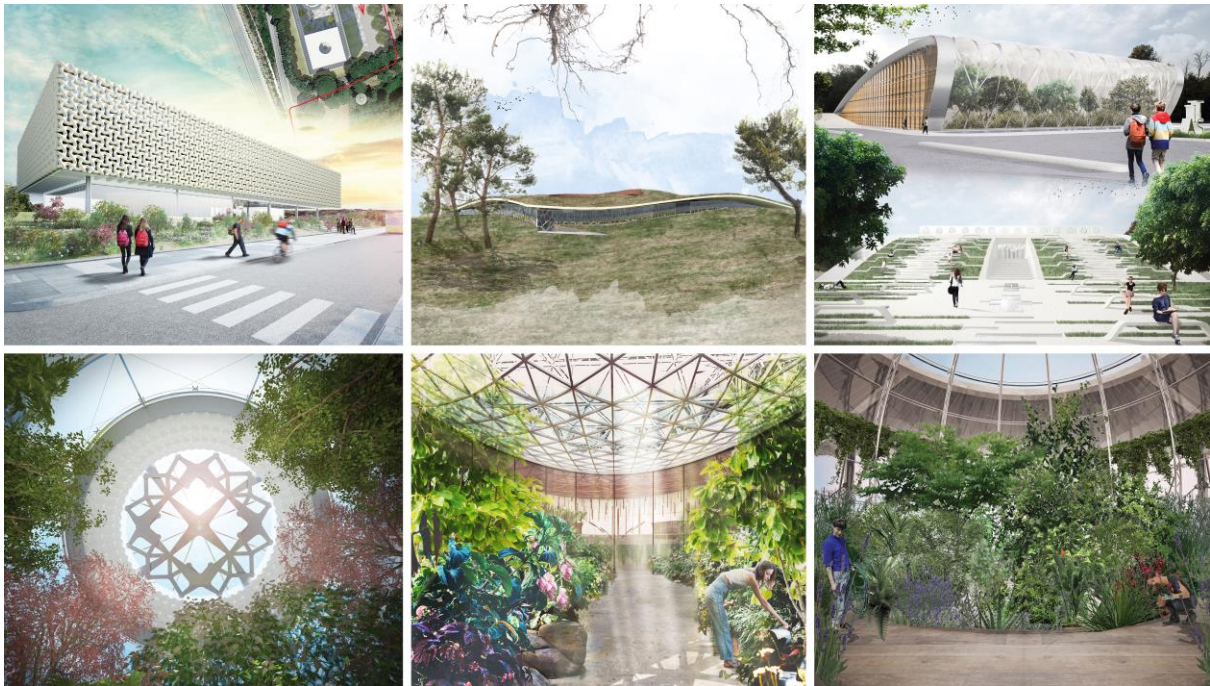


Figure 8: Other projects developed by students.

CONCLUSIONS

Concluding, it is possible to state that the experiential approach of the course has allowed students to experiment on the theme assigned, according to their real creative inclinations. In this process, the teacher takes a guiding role, directing the students' creative efforts to the most appropriate direction. In addition, the need to physically realize the prototypes in order to verify the kinetic mechanisms, made them aware of their design choices, eliminating (or at least reducing) the distance between digital abstraction and real fabrication. Furthermore, this process has induced a sentiment of enthusiasm for direct creative experimentation, which teachers should always stimulate.

ACKNOWLEDGMENTS

This paper is the result of the combined work of the three authors. The authors have revised all the paragraphs, and the paper structure and the research topics have been conceived together. However, paragraphs 1 and 6 were written by Maurizio Barberio; paragraphs 2 and 4 by Giuseppe Fallacara; paragraph 5 by Micaela Colella. Paragraph 3 is co-written by Barberio and Colella and the last two paragraphs have been co-written by the three authors. We thank all the students of the design studio 3A of the Architecture course of Politecnico di Bari (academic year 2016-17) and, in particular, Claudia Cananzi, Greta Indrio and Valentina Ditaranto, for the help in writing some parts of this paper.

REFERENCES

- Aish, R., & Hanna, S. (2017). Comparative evaluation of parametric design systems for teaching design computation. *Design Studies*.
- Barberio, M., Colella, M., & Fallacara, G. (2016). Stereotomy, Sustainable Construction and Didactics. Case study: a new Museum for Matera, European Capital of Culture 2019. In *BCCCE 2016*.
- Caneparo, L. (2007). An Agenda for Education: On the Relationship between Architectural Design Education, Technology of Architecture, and Information Technology. In Salama, A. M., & Wilkinson, N. (Eds.). (2007). *Design studio pedagogy: Horizons for the future*. Gateshead: The Urban International Press.
- Correa Zuluaga, D. & Menges, A. (2015). 3D printed hygrosopic programmable material systems. *MRS Online Proceedings Library Archive*, 1800.
- Dewey, J. (1938). *Experience and education*. Indianapolis, IN: Kappa Delta Pi.
- Dvorak, R. (1988). Designing in the CAD Studio. In *Proceedings of ACADIA*.
- Fallacara, G. (2009). Toward a stereotomic design: Experimental constructions and didactic experiences. In *Proceedings of the Third International Congress on Construction History*.
- Fallacara, G., Colella, M., & Barberio, M. (2016). Architecture and Didactics: A New Cultural Centre for Matera, European Capital of Culture 2019. *The new ARCH* 3(2). Erlangen: Get It Published.
- Fallacara, G., Barberio, M., & Colella, M. (Eds.). (2016). *Mater[i]a: Conoscenza e Progetto. Nuovo polo museale multifunzionale per Matera 2019*. Matera: La Stamperia Edizioni.
- Fallacara, G., Barberio, M., & Colella, M. (Eds.). (2017). *Concorso di progettazione. Learning by designing*. Rome: Aracne Editrice.
- Kolarevic, B. (Ed.). (2004). *Architecture in the digital age: design and manufacturing*. Abingdon: Taylor & Francis.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.
- Linn, C. D., & Fortmeyer, R., (2014), *Kinetic Architecture: Design for Active Envelopes*. Mulgrave, Victoria: The Images Publishing Group.
- Mazur, E. (1997). *Peer Instruction: A User's Manual*. Prentice Hall.
- Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). *The Limits to Growth*. Universe Books.
- Mitchell, W. J. (1977). *Computer-aided architectural design*. New York, NY: Mason Charter Pub. Inc.
- Menges, A. (2009). Performative Wood: Integral computational design for timber constructions. In *Proceedings of the 29th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)*, 66-74.
- Menges, A., & Reichert, S. (2015). Performative Wood: Physically Programming the Responsive Architecture of the HygroScope and HygroSkin Projects. *Architectural Design*, 85(5), 66-73.
- Naboni, R., & Paoletti, I. (2015). *Advanced customization in architectural design and construction*. Cham: Springer International Publishing.
- Oxman, R. (2008). Digital architecture as a challenge for design pedagogy: theory, knowledge, models and medium. *Design Studies*, 29(2), 99-120.
- Rafsanjani, A., & Pasini, D. (2016). Bistable auxetic mechanical metamaterials inspired by ancient geometric motifs. *Extreme Mechanics Letters*, 9, 291-296.
- Salama, A. M., & Wilkinson, N. (Eds.). (2007). *Design studio pedagogy: Horizons for the future*. Arti-Arch.
- I. E. Sutherland, "Sketchpad a man-machine graphical communication system", *Transactions of the Society for Computer Simulation*, 2(5), R-3, 1964.
- World Commission on Environment and Development (1987). *Report of the World Commission on environment and development: Our Common Future*.
- Yeganeh, B., & Kolb, D. (2009). Mindfulness and experiential learning, *Od Practitioner* 41(3), 8-14.

Link and Match Learning Outcomes of Entrepreneurial Competencies Required in Indonesian Companies

Muhammad Naufal ABDILLAH

Faculty of Administrative Sciences

Universitas Indonesia

naufal6abdillah@gmail.com

Eko SAKAPURNAMA

S.Psi., MBA.

Faculty of Administrative Sciences

Universitas Indonesia

Eko.sakapurnama@ui.ac.id

ABSTRACT

Nowadays, Intrapreneur skill is one of the competencies urgently needed in the globalization era that can serve as a leverage for a business competitiveness. This study aims to analyze the needs for entrepreneurial competences in Indonesian companies. An entrepreneur is someone who creates a new business, in the face of risks and uncertainties, and who aims to seek profit and growth by identifying opportunities through a combination of resources to get the benefits therefrom. Entrepreneurial competences are measured through 19 indicators, a method which was introduced by Izquierdo, Deschoolmester, and Salazar (2005). This study applies quantitative method through distribution of questionnaires toward 30 companies in Indonesia. The result shows that companies are highly in need of employees who have entrepreneurial competences.

Keywords: Entrepreneurial Competence, Entrepreneur, Intrapreneur, Learning Outcome

INTRODUCTION

In order to face the globalization era and help boosting economic growth in Indonesia, companies compete to develop their business. Thus, it is vital for them to have human resources with entrepreneurial skills, since they are essential to ensure the company's sustainability (Michaels and Axelrod, 2001). Some experts argued that human resource is the foremost asset of a company which serves as a planner and active actor of each of the organization's activity. They have diverse thoughts, feelings, desires, statuses, educational backgrounds, ages, and sexes which they bring into the organization (Hasibuan, 2005; Bernardin, Russel, 2003). Human resource is not a machine, money, or material that is passive in nature nor it is something that can be fully controlled to support an organization's goal. This shows the importance of human resource for a company. In fact, according to Parwati Surjaudjaja, the President Director of PT Bank OCBC NISP (portalhr, 2012), many banks setting up their business in Indonesia are willing to pay competitive human resources even above the market price for the sake of developing their business. Human being is endowed with mind by the Almighty, which enables them to think about matters that were considered impossible before. Human being can create and innovate. They can also think about an idea, develop it, and put it into reality. Furthermore, they also have different capabilities and skills to complement each other. It is this diversity that makes human beings invaluable for companies. Thus, human being or human resource is nowadays considered as a determinant element for a company's competitiveness (Dale, 2001, Sakapurnama 2016).

Among so many people, obviously there are some who have certain talents in certain fields, which are often referred to as talented people. Maintaining company's presence amidst the rigorous competition requires a pool of talents, mainly not for the present, but rather for the future, which is often referred to as human resources investment. However, company's growth will be hindered if in such a stringent talent war, it resorts to the wrong talent. To address this, therefore, companies compete to invest in human resources by applying good human resources management to survive in this war.

In particular with the ASEAN Economic Community (AEC, MEA in Indonesian) which already started in 2015, business competition between companies have become more stringent. A quote from BBC Indonesia (2014) explained that the ASEAN Economic Community is a single market in Southeast Asia which started to be effective in 2015. The formation of this single market enables countries to sell goods and services to each other seamlessly across Southeast Asia, which is carried out especially by eliminating all barriers between them. In addition, AEC will also open up the flow of labor market. In an interview with BBC Indonesia, the Special Staff to Minister of Manpower and Transmigration, Dita Indah Sari, explained that the implementation of Southeast Asia single market means the removal of barriers in professional labor sector, which will in turn open up opportunity for foreign workers to work in various positions and professions in Indonesia (Sakapurnama, 2016).

According to an economist from Indonesia Islamic University of Yogyakarta (UII), Edy Suandi Hamid, the government and economic actors must be more offensive in anticipating the AEC 2015. The AEC must be perceived as a two-fold increase of market for Indonesia. Furthermore, AEC will also liberalize the professional labor market which in turn will create more competition both for companies and job seekers. He also added that currently there are approximately 600,000 intellectual unemployed people in Indonesia. This condition will force them to work harder to improve their competence. On the other hand, companies need also to develop their quality and be more selective in recruiting professional workers.

When it concerns an individual competence, it is imperative to have a skill that matches the need of the company where that particular individual wants to work in. Oppositely, in order to decide whether an individual is talented or not, a company needs to see and measure the individual based on certain assessment components. On this regard, Sakapurnama and Budiwan (2015) conducted a study on the need of Indonesian companies to face the AEC era, which results show that companies need talents with several core competences, such as high adaptation skill, capability of quick learning, innovative capability, etc., as can be seen on Chart 1.1.

In fact, employees or talents with such competences seem to possess the similar competences of an entrepreneur which, as Isquierdo, Deschoolmester, and Salazar (2005) suggested, consist of 19 indicators. Some of their points are identical with those introduced by Sakapurnama and Budiwan (2015) in their study, namely innovative mindset and ability to learn foreign language. Furthermore, Chandler and Hanks (1994) argued that an entrepreneur's competences include the ability to observe the surrounding environment, be aware of potential opportunity, and take advantage of such a potential by making a certain strategy. It can be said, therefore, that a company needs an employee who has the competence of an entrepreneur. Having a talent with entrepreneurial capacity will benefit the company through his/her ability to innovate and creativity in solving problems faced by the company, as well as by giving new ideas and business plans for a company just like an entrepreneur.

An entrepreneur is defined as an individual who pays a certain amount for a certain product, which he/she will sell at uncertain price, while making decisions to achieve and maximize the use of resources as well as accepting the risks entailed from the business (Holt, 1993, Churchill, 1992). Meanwhile, according to Zimmerer (2002), an entrepreneur is someone who creates a new business while facing risks and uncertainty, and who aims to seek profit and growth through identification of opportunities through a combination of resources to obtain benefits therefrom. Through such definitions, it can be argued that someone who has entrepreneurial soul is the one who dares to take a new step, dares to take risk, enthusiastic toward change, and possesses an out-of-the-box thought.

Someone having an entrepreneurial spirit normally is an individual who tends to prefer to build his own business rather than working as an employee in a company. However, having an employee with entrepreneurial spirit a.k.a. intrapreneur will allow the company to grow significantly and keep up with the challenges of the age, which is undeniably a competitive advantage (Antoncic, Jasna Auer & Antoncic, Bostjan. 2011). This resonates with what was stated by Churchill (1992), that intrapreneur can create a new value for the company.

THEORETICAL REVIEW

According to Zimmerer and Scarborough (2002), an entrepreneur is someone who creates a new business and faces risks and uncertainty, and who aims to seek profit and growth by identifying opportunities through a combination of resources to benefit therefrom.

Izquierdo, Deschoolmester & Salazar (2005) summarize the entrepreneur competences as follows:

1. Capable of identifying a business opportunity
2. Capable of evaluating a business opportunity
3. Capable of making decision
4. Capable of identifying problems and finding their solution
5. Having a wide connection/network
6. Having a good verbal communication skill
7. Capable of overcoming uncertainty
8. Having an innovative thought
9. Having the capacity to build a solid team
10. Capable of making agreement in a negotiation
11. Capable of properly responding to failure
12. Capable of overcoming stress
13. Capable of calculating and dares to take risk
14. Having good intuition
15. Having distinctive perspective toward the market
16. Capable of collaborating
17. Capable of analyzing problem
18. Capable of proper written communication
19. Capable of learning another language

METHOD

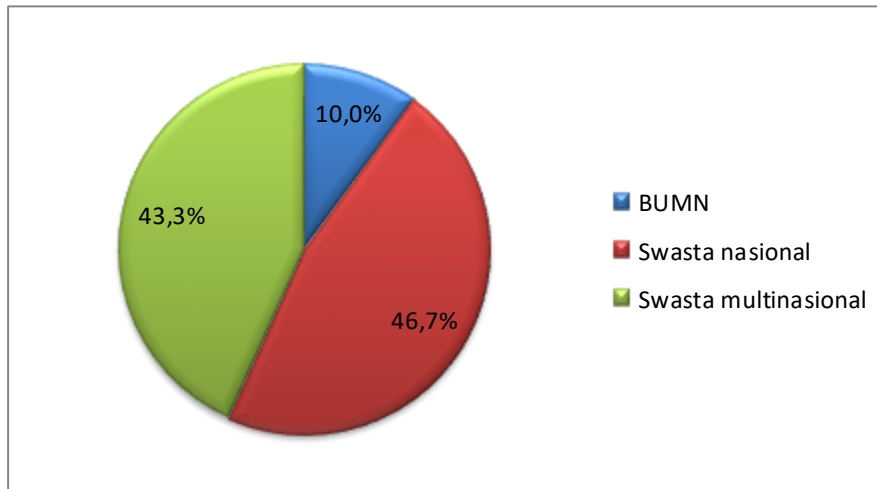
The study is quantitative-based which applies descriptive analysis which aims to explain about the need of a company for employees who have entrepreneurial competence. The study is a pure research and is categorized as cross-sectional, and was conducted in March 2015 to April 2015. The primary data collection was conducted by survey using questionnaires. The secondary data collection was conducted through desk-study on books, journals, previous researches, and internet. The population in this study is various companies across Indonesia, both State-owned Enterprises (SOEs) and private sector, and the selected population criteria are recruitment departments of companies in Indonesia both at the SOEs and private sector. The samples of this study are one employee from each company, both the SOEs and private sector, who represent their respective company. The sampling technique applied was convenience sampling method. The result of the study was processed using the SPSS version 18.0 which was afterward described by using mean concentration. The results of the data processing are then presented in pie chart, bar chart, and tabulation tablet, which are then elaborated into texts.

ANALYSIS AND DISCUSSION

Respondents' Characteristics

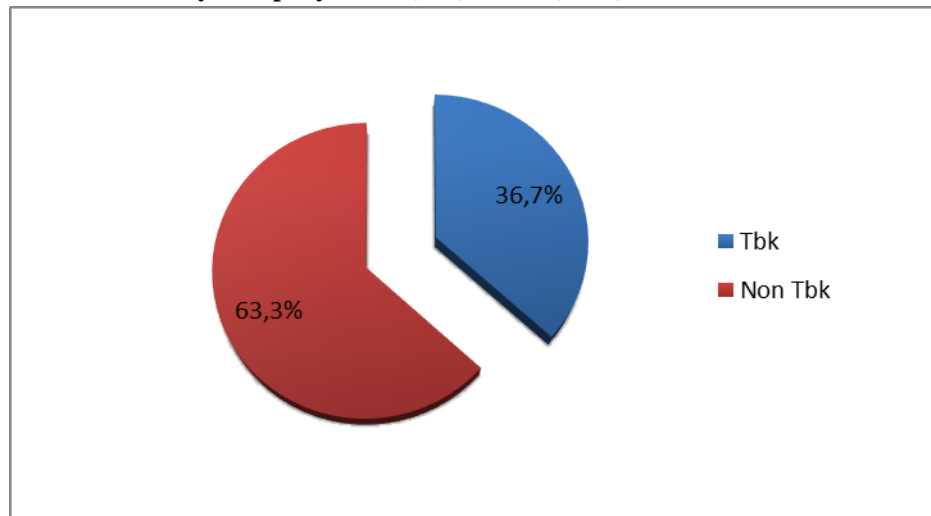
The descriptive statistic analysis of this study is conducted to describe and explain about the overall respondents' characteristics who were analyzed by the type of company, company's status (Tbk/Ltd), number of employee, and company's capitalization. The results of the analysis will be elaborated with several diagrams such as pie chart, bar chart, and pipe chart.

Respondents' Characteristics by Company's Type (n=30)



Source: Result of primary data processing using SPSS version 18.0 (2015)

Respondents' Characteristics by Company's Tbk (Ltd) Status (n=30)



Source: Result of primary data processing using SPSS version 18.0 (2015)

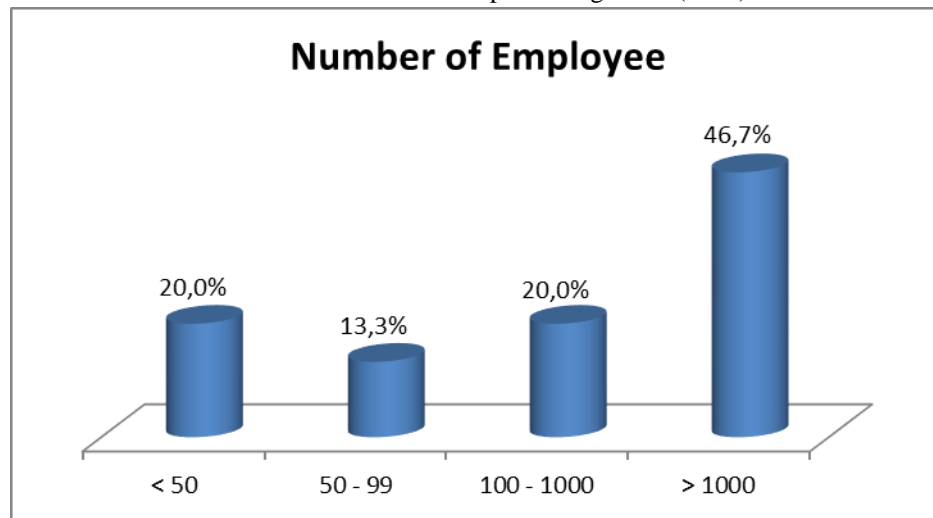
Respondents' Characteristics by Number of Employee

Frequency of Number of Respondent Employee

Category	Number of Employee	Frequency
1	< 50	6
2	50 – 99	4
3	100 – 1000	6
4	> 1000	14

N=30

Source: Researchers' data processing result (2015)



Source: Result of primary data processing using SPSS version 18.0 (2015)

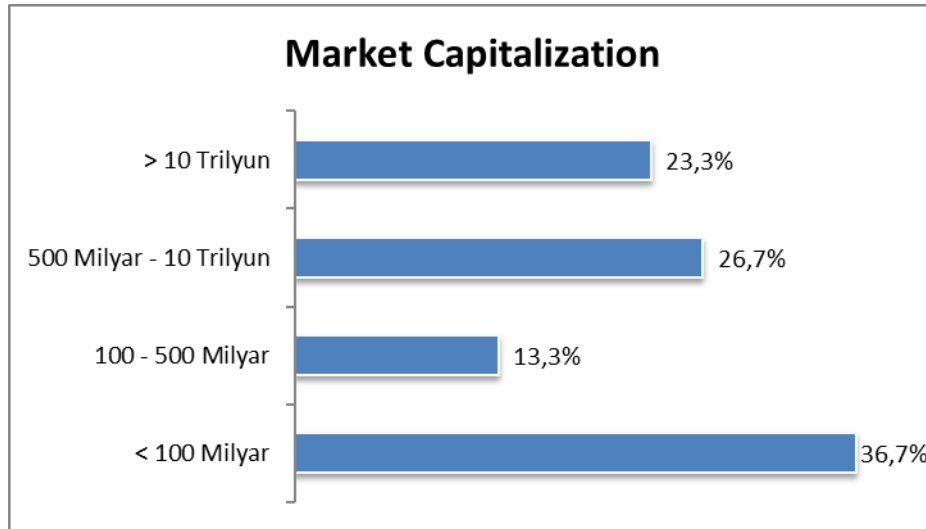
Respondents' Characteristics by Company's Capitalization

Frequency of Category of Company's Capitalization

Category	Company's Capitalization	Frequency
1	< 100 Billion	11
2	100 - 500 Billion	4
3	500 Billion - 10 Trillion	8
4	> 10 Trillion	7

N=30

Source: Researchers' data processing result (2015)



Source: Result of primary data processing using SPSS version 18.0 (2015)

Mean Result Analysis

Mean Descriptive Statistics

No	Statement	Mean	Interpretation
1	Company needs employees who are able to identify business opportunity	4.30	Highly need
2	Company needs employees who are able to evaluate business opportunity	4.17	Need
3	Company needs employee who are able to make decision	4.53	Highly need
4	Company needs employees who are able to identify problems and find the solutions	4.77	Highly need
5	Company needs employees who have a wide connection/network	4.10	Need
6	Company needs an employee who have good verbal communication skill	4.50	Highly need
7	Company needs employees who can overcome uncertainty	4.03	Need
8	Company needs employees who have innovative thoughts	4.50	Highly need
9	Company needs employees who are able to build a solid team	4.43	Highly need
10	Company needs employees who are able to make agreement in negotiation	4.23	Highly need
11	Company needs employees who are able to face and respond to failure properly	4.23	Highly need
12	Company needs employees who can properly handle stress	4.27	Highly need
13	Company needs employees who are able to calculate and dare to take risk	4.07	Need
14	Company needs employees who have good intuition	4.10	Need

15	Company needs employees who have different perspective on market	3.80	Need
16	Company needs employees who have collaboration skill	4.57	Highly need

Continued

No	Statement	Mean	Interpretation
17	Company needs employees who are able to analyze problem	4.57	Highly need
18	Company needs employees who have proper written communication skill	4.23	Highly need
19	Company needs employee who are able to learn another language	3.93	Need
Total Mean		4.28	Highly need

From the above table, it can be concluded that entrepreneurial competences are highly needed, with the total mean for the entire 19 indicators is at 4.28, which is therefore categorized into the 'highly need' category. The data indicate that companies in Indonesia truly need individuals or employees who have entrepreneurial competences.

CONCLUSION

Based on the analysis on descriptive statistic, mean, and variables on entrepreneur competence, it can be concluded that companies in Indonesia highly need employees who have entrepreneur's competence. This indicates that the concept of intrapreneur is highly favored by these companies, particularly with the fact that those companies are highly in need of employees with entrepreneurial competences. On the other hand, entrepreneurial competence is a must have competence for job seekers in order to be accepted into companies in Indonesia.

REFERENCES

- Antonovic, Jasna Auer & Antonovic, Bostjan. 2011. *Employee Satisfaction, Intrapreneurship and Firm Growth: A Model*. Emerald Group.
- Bernardin, John H & Russel, Joyce E. A. 1993. *Human Resources Management*. Mc Graw Hill.
- Chandler, G. N., and S. H. Hanks, 1994. "Founder Competence, the Environment and Venture Performance," *Entrepreneurship Theory and Practice*, 18(3), 77–89.
- Churchill, N.C. 1992. "Research issues in entrepreneurship", in Sexton, D.L. and Kasarda, J.D. (Eds), *The State of the Art of Entrepreneurship*, PWS-KENT, Boston, MA.
- Dale, Margareth. 2001. *Successful Recruitment and Selection: A Practical Guide for Managers*. Kogan Page Limited, London.
- Hasibuan, Malayu S.P, Drd.H. 2005. *Manajemen Sumber Daya Manusia*. Jakarta : bumi Aksara
- Hisrich, R.D., Peters, M.P., dan Shepherd D.A. 2008. *Kewirausahaan Edisi 7*. Edisi Bahasa Indonesia. Jakarta: Salemba empat.
- Holt, David K. 1993. *Management, Principles and Practices*. Prentice Hall Inc., Englewood Cliffs., N.J.
- Izquierdo, E., Deschoolmester, D., & Salazar, D. 2005. *The Importance of Competencies for Entrepreneurship: A View from Entrepreneurs and Scholars' Perspective*. ESPA.
- Michaels, E., Handfield-Jones, H. & Axelrod, B. 2001. *The war for talent*. Boston: Harvard Business School Press.
- Sakapurnama, Eko & Budiman, Teddy Indira. 2015. *Strategi Rekrutmen dan Pengembangan Karyawan Pada Perusahaan Di Indonesia Dalam Menghadapi Masyarakat Ekonomi ASEAN (MEA) 2015*. Universitas Indonesia
- Zimmerer, Thomas W. & Scarborough, Norman M. *Essentials of Entrepreneurship and Small Business Management*. 2002. 3rd Edition, Prentice Hall, Upper Sadleriver.

Link and Match Learning Outcomes of Entrepreneurial Competencies Required in Indonesian Companies

Muhammad Naufal ABDILLAH

Naufal6ab Faculty of Administrative Sciences

Universitas Indonesia

dillah@gmail.com

Eko SAKAPURNAMA

S.Psi., MBA.

Faculty of Administrative Sciences

Universitas Indonesia

Eko.sakapurnama@ui.ac.id

ABSTRACT

Nowadays, Intrapreneur skill is one of the competencies urgently needed in the globalization era that can serve as a leverage for a business competitiveness. This study aims to analyze the needs for entrepreneurial competences in Indonesian companies. An entrepreneur is someone who creates a new business, in the face of risks and uncertainties, and who aims to seek profit and growth by identifying opportunities through a combination of resources to get the benefits therefrom. Entrepreneurial competences are measured through 19 indicators, a method which was introduced by Izquierdo, Deschoolmester, and Salazar (2005). This study applies quantitative method through distribution of questionnaires toward 30 companies in Indonesia. The result shows that companies are highly in need of employees who have entrepreneurial competences.

Keywords: Entrepreneurial Competence, Entrepreneur, Intrapreneur, Learning Outcome

INTRODUCTION

In order to face the globalization era and help boosting economic growth in Indonesia, companies compete to develop their business. Thus, it is vital for them to have human resources with competence above the average, since they are essential to ensure the company's sustainability (Michaels and Axelrod, 2001). Some experts argued that human resource is the foremost asset of a company which serves as a planner and active actor of each of the organization's activity. They have diverse thoughts, feelings, desires, statuses, educational backgrounds, ages, and sexes which they bring into the organization (Hasibuan, 2005; Bernardin, Russel, 2003). Human resource is not a machine, money, or material that is passive in nature nor it is something that can be fully controlled to support an organization's goal. This shows the importance of human resource for a company. In fact, according to Parwati Surjaudjaja, the President Director of PT Bank OCBC NISP (portalhr, 2012), many banks setting up their business in Indonesia are willing to pay competitive human resources even above the market price for the sake of developing their business. Human being is endowed with mind by the Almighty, which enables them to think about matters that were considered impossible before. Human being can create and innovate. They can also think about an idea, develop it, and put it into reality. Furthermore, they also have different capabilities and skills to complement each other. It is this diversity that makes human beings invaluable for companies. Thus, human being or human resource is nowadays considered as a determinant element for a company's competitiveness (Dale, 2001, Sakapurnama 2016).

Among so many people, obviously there are some who have certain talents in certain fields, which are often referred to as talented people. Maintaining company's presence amidst the rigorous competition requires a pool of talents, mainly not for the present, but rather for the future, which is often referred to as human resources investment. However, company's growth will be hindered if in such a stringent talent war, it resorts to the wrong talent. To address this, therefore, companies compete to invest in human resources by applying good human resources management to survive in this war.

In particular with the ASEAN Economic Community (AEC, MEA in Indonesian) which already started in 2015, business competition between companies have become more stringent. A quote from BBC Indonesia (2014) explained that the ASEAN Economic Community is a single market in Southeast Asia which started to be effective in 2015. The formation of this single market enables countries to sell goods and services to each other seamlessly across Southeast Asia, which is carried out especially by eliminating all barriers between them. In addition, AEC will also open up the flow of labor market. In an interview with BBC Indonesia, the Special Staff to Minister of Manpower and Transmigration, Dita Indah Sari, explained that the implementation of Southeast Asia single market means the removal of barriers in professional labor sector, which will in turn open up opportunity for foreign workers to work in various positions and professions in Indonesia (Sakapurnama, 2016).

According to an economist from Indonesia Islamic University of Yogyakarta (UII), Edy Suandi Hamid, the government and economic actors must be more offensive in anticipating the AEC 2015. The AEC must be perceived as a two-fold increase of market for Indonesia. Furthermore, AEC will also liberalize the professional labor market which in turn will create more competition both for companies and job seekers. He also added that currently there are approximately 600,000 intellectual unemployed people in Indonesia. This condition will force them to work harder to improve their competence. On the other hand, companies need also to develop their quality and be more selective in recruiting professional workers.

When it concerns an individual competence, it is imperative to have a skill that matches the need of the company where that particular individual wants to work in. Oppositely, in order to decide whether an individual is talented or not, a company needs to see and measure the individual based on certain assessment components. On this regard, Sakapurnama and Budiwan (2015) conducted a study on the need of Indonesian companies to face the AEC era, which results show that companies need talents with several core competences, such as high adaptation skill, capability of quick learning, innovative capability, etc., as can be seen on Chart 1.1.

In fact, employees or talents with such competences seem to possess the similar competences of an entrepreneur which, as Isquierdo, Deschoolmester, and Salazar (2005) suggested, consist of 19 indicators. Some of their points are identical with those introduced by Sakapurnama and Budiwan (2015) in their study, namely innovative mindset and ability to learn foreign language. Furthermore, Chandler and Hanks (1994) argued that an entrepreneur's competences include the ability to observe the surrounding environment, be aware of potential opportunity, and take advantage of such a potential by making a certain strategy. It can be said, therefore, that a company needs an employee who has the competence of an entrepreneur. Having a talent with entrepreneurial capacity will benefit the company through his/her ability to innovate and creativity in solving problems faced by the company, as well as by giving new ideas and business plans for a company just like an entrepreneur.

An entrepreneur is defined as an individual who pays a certain amount for a certain product, which he/she will sell at uncertain price, while making decisions to achieve and maximize the use of resources as well as accepting the risks entailed from the business (Holt, 1993, Churchill, 1992). Meanwhile, according to Zimmerer (2002), an entrepreneur is someone who creates a new business while facing risks and uncertainty, and who aims to seek profit and growth through identification of opportunities through a combination of resources to obtain benefits therefrom. Through such definitions, it can be argued that someone who has entrepreneurial soul is the one who dares to take a new step, dares to take risk, enthusiastic toward change, and possesses an out-of-the-box thought.

Someone having an entrepreneurial spirit normally is an individual who tends to prefer to build his own business rather than working as an employee in a company. However, having an employee with entrepreneurial spirit a.k.a. intrapreneur will allow the company to grow significantly and keep up with the challenges of the age, which is undeniably a competitive advantage (Antoncic, Jasna Auer & Antoncic, Bostjan. 2011). This resonates with what was stated by Churchill (1992), that intrapreneur can create a new value for the company.

THEORETICAL REVIEW

According to Zimmerer and Scarborough (2002), an entrepreneur is someone who creates a new business and faces risks and uncertainty, and who aims to seek profit and growth by identifying opportunities through a combination of resources to benefit therefrom.

Izquierdo, Deschoolmester & Salazar (2005) summarize the entrepreneur competences as follows:

1. Capable of identifying a business opportunity
2. Capable of evaluating a business opportunity
3. Capable of making decision
4. Capable of identifying problems and finding their solution

5. Having a wide connection/network
6. Having a good verbal communication skill
7. Capable of overcoming uncertainty
8. Having an innovative thought
9. Having the capacity to build a solid team
10. Capable of making agreement in a negotiation
11. Capable of properly responding to failure
12. Capable of overcoming stress
13. Capable of calculating and dares to take risk
14. Having good intuition
15. Having distinctive perspective toward the market
16. Capable of collaborating
17. Capable of analyzing problem
18. Capable of proper written communication
19. Capable of learning another language

METHOD

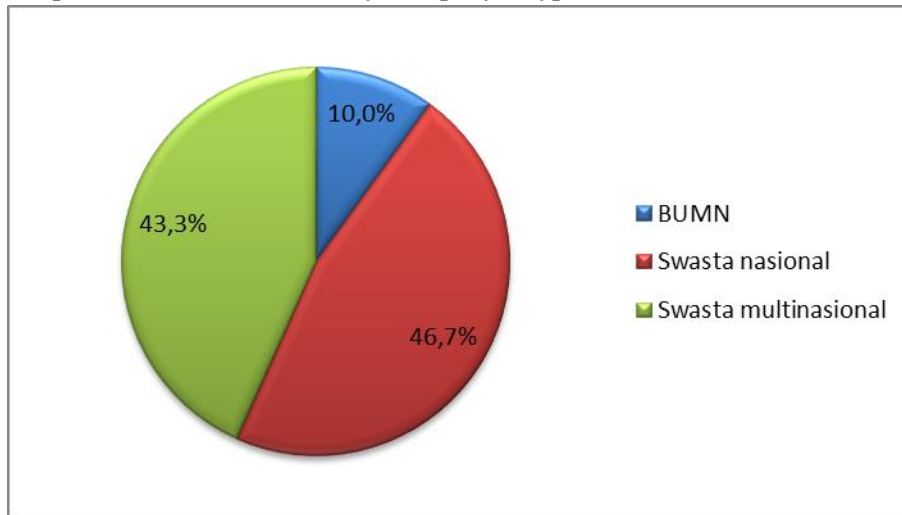
The study is quantitative-based which applies descriptive analysis which aims to explain about the need of a company for employees who have entrepreneurial competence. The study is a pure research and is categorized as cross-sectional, and was conducted in March 2015 to April 2015. The primary data collection was conducted by survey using questionnaires. The secondary data collection was conducted through desk-study on books, journals, previous researches, and internet. The population in this study is various companies across Indonesia, both State-owned Enterprises (SOEs) and private sector, and the selected population criteria are recruitment departments of companies in Indonesia both at the SOEs and private sector. The samples of this study are one employee from each company, both the SOEs and private sector, who represent their respective company. The sampling technique applied was convenience sampling method. The result of the study was processed using the SPSS version 18.0 which was afterward described by using mean concentration. The results of the data processing are then presented in pie chart, bar chart, and tabulation tablet, which are then elaborated into texts.

ANALYSIS AND DISCUSSION

Respondents' Characteristics

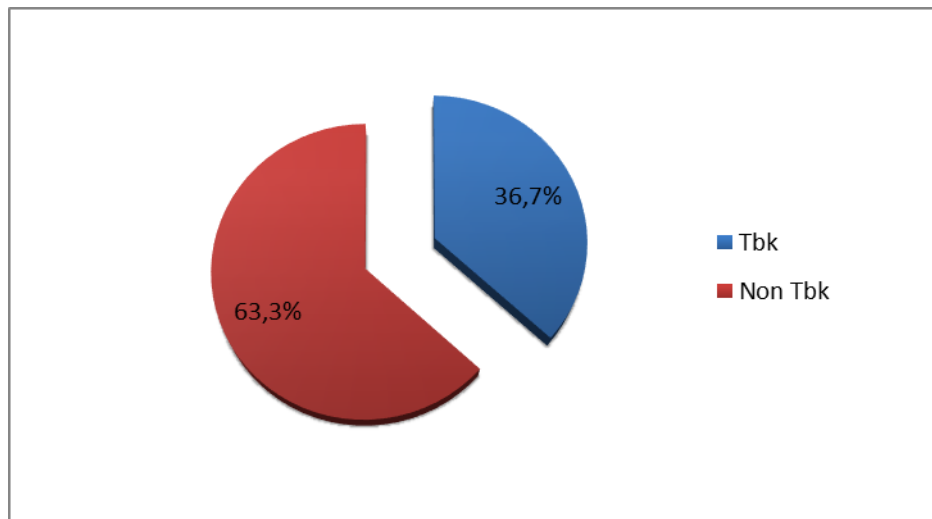
The descriptive statistic analysis of this study is conducted to describe and explain about the overall respondents' characteristics who were analyzed by the type of company, company's status (Tbk/Ltd), number of employee, and company's capitalization. The results of the analysis will be elaborated with several diagrams such as pie chart, bar chart, and pipe chart.

Respondents' Characteristics by Company's Type (n=30)



Source: Result of primary data processing using SPSS version 18.0 (2015)

Respondents' Characteristics by Company's Tbk (Ltd) Status (n=30)



Source: Result of primary data processing using SPSS version 18.0 (2015)

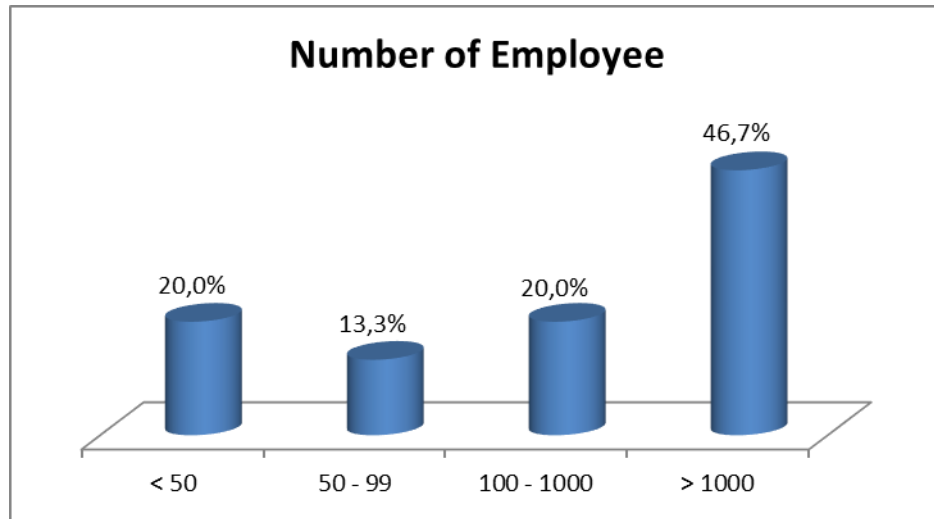
Respondents' Characteristics by Number of Employee

Frequency of Number of Respondent Employee

Category	Number of Employee	Frequency
1	< 50	6
2	50 – 99	4
3	100 – 1000	6
4	> 1000	14

N=30

Source: Researchers' data processing result (2015)



Source: Result of primary data processing using SPSS version 18.0 (2015)

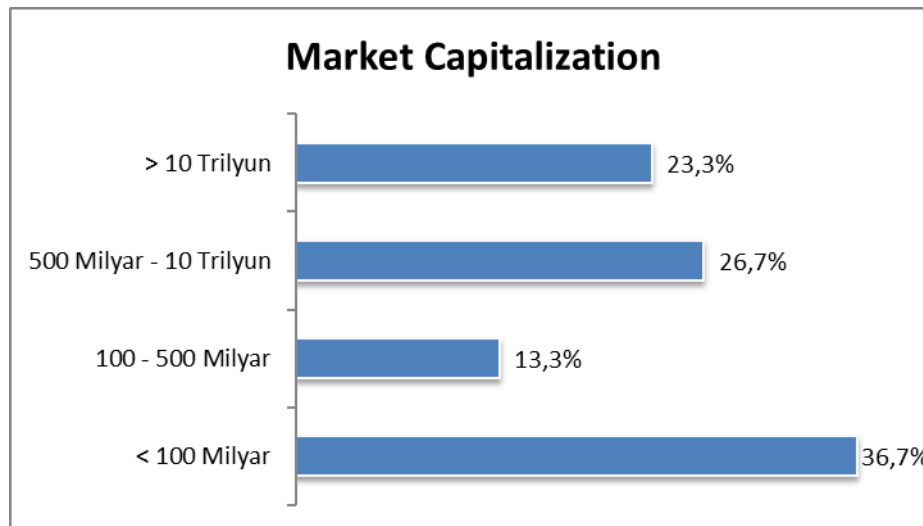
Respondents' Characteristics by Company's Capitalization

Frequency of Category of Company's Capitalization

Category	Company's Capitalization	Frequency
1	< 100 Billion	11
2	100 - 500 Billion	4
3	500 Billion - 10 Trillion	8
4	> 10 Trillion	7

N=30

Source: Researchers' data processing result (2015)



Source: Result of primary data processing using SPSS version 18.0 (2015)

Mean Result Analysis

Mean Descriptive Statistics

No	Statement	Mean	Interpretation
1	Company needs employees who are able to identify business opportunity	4.30	Highly need
2	Company needs employees who are able to evaluate business opportunity	4.17	Need
3	Company needs employee who are able to make decision	4.53	Highly need
4	Company needs employees who are able to identify problems and find the solutions	4.77	Highly need
5	Company needs employees who have a wide connection/network	4.10	Need
6	Company needs an employee who have good verbal communication skill	4.50	Highly need
7	Company needs employees who can overcome uncertainty	4.03	Need
8	Company needs employees who have innovative thoughts	4.50	Highly need
9	Company needs employees who are able to build a solid team	4.43	Highly need
10	Company needs employees who are able to make agreement in negotiation	4.23	Highly need
11	Company needs employees who are able to face and respond to failure properly	4.23	Highly need
12	Company needs employees who can properly handle stress	4.27	Highly need
13	Company needs employees who are able to calculate and dare to take risk	4.07	Need
14	Company needs employees who have good intuition	4.10	Need
15	Company needs employees who have different perspective on market	3.80	Need
16	Company needs employees who have collaboration skill	4.57	Highly need

Continued

No	Statement	Mean	Interpretation
17	Company needs employees who are able to analyze problem	4.57	Highly need
18	Company needs employees who have proper written communication skill	4.23	Highly need
19	Company needs employee who are able to learn another language	3.93	Need
Total Mean		4.28	Highly need

From the above table, it can be concluded that entrepreneurial competences are highly needed, with the total mean for the entire 19 indicators is at 4.28, which is therefore categorized into the 'highly need' category. The data indicate that companies in Indonesia truly need individuals or employees who have entrepreneurial competences.

CONCLUSION

Based on the analysis on descriptive statistic, mean, and variables on entrepreneur competence, it can be concluded that companies in Indonesia highly need employees who have entrepreneur's competence. This indicates that the concept of intrapreneur is highly favored by these companies, particularly with the fact that those companies are highly in need of employees with entrepreneurial competences. On the other hand, entrepreneurial competence is a must have competence for job seekers in order to be accepted into companies in Indonesia.

REFERENCES

- Antoncic, Jasna Auer & Antoncic, Bostjan. 2011. *Employee Satisfaction, Intrapreneurship and Firm Growth: A Model*. Emerald Group.
- Bernardin, John H & Russel, Joyce E. A. 1993. *Human Resources Management*. Mc Graw Hill.
- Chandler, G. N., and S. H. Hanks, 1994. "Founder Competence, the Environment and Venture Performance," *Entrepreneurship Theory and Practice*, 18(3), 77–89.
- Churcill, N.C. 1992. "Research issues in entrepreneurship", in Sexton, D.L. and Kasarda, J.D. (Eds), *The State of the Art of Entrepreneurship*, PWS-KENT, Boston, MA.
- Dale, Margareth. 2001. *Successful Recruitment and Selection: A Practical Guide for Managers*. Kogan Page Limited, London.
- Hasibuan, Malayu S.P, Drd.H. 2005. *Manajemen Sumber Daya Manusia*. Jakarta : bumi Aksara.
- Hisrich, R.D., Peters, M.P., dan Shepherd D.A. 2008. *Kewirausahaan Edisi 7*. Edisi Bahasa Indonesia. Jakarta: Salemba empat.
- Holt, David K. 1993. *Management, Principles and Practices*. Prentice Hall Inc., Englewood Cliffs., N.J.
- Izquierdo, E., Deschoolmester, D., & Salazar, D. 2005. *The Importance of Competencies for Entrepreneurship: A View from Entrepreneurs and Scholars' Perspective*. ESPA.
- Michaels, E., Handfield-Jones, H. & Axelrod, B. 2001. *The war for talent*. Boston: Harvard Business School Press.
- Sakapurnama, Eko & Budiman, Teddy Indira. 2015. *Strategi Rekrutmen dan Pengembangan Karyawan Pada Perusahaan Di Indonesia Dalam Menghadapi Masyarakat Ekonomi ASEAN (MEA) 2015*. Universitas Indonesia
- Zimmerer, Thomas W. & Scarborough, Norman M. *Essentials of Entrepreneurship and Small Business Management*. 2002. 3rd Edition, Prentice Hall, Upper Sadleriver.

Machine Learning in the Medical Field for Decision Making

Bochra TRIQUI

Center for Artificial Intelligent

USTO-MB University

Algeria

triqui_bouchra@yahoo.fr

Abdelkader BENYETTOU

Center for Artificial Intelligent

USTO-MB University

Algeria

a_benyettou@yahoo.fr

ABSTRACT

In this article, we discuss the cardiac arrhythmia learning machine by making a comparative study between the SVM model and the neural networks to set up a classifier of cardiac pathologies. Both methods are part of supervised learning. SVMs are applied with remarkable efficacy to the recognition of cardiac arrhythmias. This article proposes a comparison between the MLP and the SVM, specifying the advantages of each method in machine learning.

Keywords: Premature Ventricular Contraction (PVCs), Electrocardiogram (ECG), recognition, SVM, Multilayer neuronal, Artificial Intelligence.

INTRODUCTION

The rates of mortality relative to cardiovascular diseases are high. According to the (Impact of Technology, 2017), cardiovascular diseases are one of the most important causes of mortality in the world. Sudden death represents the half of deaths that have cardiac origins, the average age is between 50 and 60 years old but it can occur at any time. The mechanisms of this sudden death are principally ventricular arrhythmias with a percentage of 75% where the presence of Premature Ventricular Contraction (PVC), is considered as an eventual predictor. An ECG signal is frequently used in clinic practices by cardiologists in order to determinate the origins of cardiac anomalies.

In this paper, we deal with the learning machine from cardiac data by to two techniques; the first one is the SVM classifier and the second one is the MLP, which is relative to neurons networks model aiming an implementation of two classifiers of cardiac pathologies.

This article is organized as follows:

First, we will expose some notions of heart physiology, which will allow us to know better the physiologic type of ECG on the one hand and help us to choose the representative parameters of a heartbeat on the other hand. Secondly, we will discuss about artificial neuronal networks focusing on the Multi-layer perceptron in order to compare it with SVM model. The third part contains principally a presentation of SVM model. In conclusion, we will present the results of cardiac anomalies classification, after using the two techniques paying attention the ventricular pathology.

RELATED WORKS

Several approaches have been tried for cardiac arrhythmia classification. For early detection of diseases, in (Moreas, Seixas, Vilani, 2002), the classification of QRS complexes uses the Mahalanobis distance as a classification criterion. The classifier was tested on 44 records from the MIT-BIH database and the results gave a sensitivity of 90.74%, and a positive predictivity of 96.55%. (Exarchos, Tsipouras, 2007), have developed expert systems based on fuzzy logic to classify arrhythmias and ischemic beats. They achieved an accuracy of 96.43% and a sensitivity of 96%. In (Chikh, Benali, 2009), they proposed a model for the explicit classification of premature ventricular beats (BVPs) from the physiological electrocardiogram (ECG) signal.

This involves presenting the physician with a set of cases and scenarios on the patient's data to help him make a diagnosis.

(Yeh, 2001), proposed the Fuzzy Logic Method (FLM) for the analysis of ECG signals. It allows classifying and distinguishing the two heart beats, normal beats and abnormal beats. The method gave a classification rate of 93.78%. In (Zeghoudi, 2010), knowledge extraction and classification of cardiac arrhythmias are done also by neural networks. They proposed different classifiers of cardiac arrhythmias by application of neural networks. The system was validated on real signals from the MIT-BIH database; the results obtained in terms of recognition rates are 95.35%, sensitivity 93.30%, specificity 99.77%. In (Mateo, 2011), the authors used the Radial Basis function of neural networks with satisfactory results, thus offering a great reduction in ectopic beats for the recording of ECG signals. In (Lachiri, 2011), present a method for the automatic classification of heart disease from an electrocardiogram (ECG). This treatment is based on an analysis of certain morphological parameters for the recognition of 8 heart diseases. The morphological parameters were divided into homogeneous groups (amplitude, surface, interval and slope). These parameters are calculated for beats with 8 types of abnormalities from ECG records retrieved from the MIT-BIH arrhythmia database. This study resulted in a maximum overall rate of 82.14% for all morphological parameters. Analysis of the different groups separately showed that the best recognition performance was 96.36% for the surface parameters. The worst is 66.07% for the amplitude parameters.

In (Abdelliche, 2011), his PhD thesis entitled Contribution to the Diagnosis of Electrocardiographic Signals using the concepts of fractals, is an algorithm for the treatment of the ECG signal and detection of the QRS complex, he described in his doctoral dissertation based on the use of the continuous wavelet transform and the fractional wavelets. The ECG signals used in practice are derived from the MIT-BIH database. In fact, the sensitivity is evaluated at 99.66%, while the positive predictability is appreciated at 99.84%. Error rates varied between 0% and 4.08% with an average of 0.5%, and the total detection rate equaled 99.50% of QRS detected.

In (Triqui, 2012), artificial neural networks (PMC multi-layer perception network and SOM map) were used in classification and discrimination. The classification experiments are presented using the MIT-BIH database and the results have a sensitivity of 82.20%, a specificity of 95.18% and a classification rate of 92.78%. The SVM networks were used in (Hendel & al, 2016), as a multi class classification of cardiac arrhythmias, by achieving an average accuracy of 99.73%, and showed that the SVM post-treatment outputs can improve the classification decision in terms of probability, this approach was also used to solve the multi-classification ECG problem in (Li, 2017).

CHARACTERIZATION OF ECG SIGNAL

Electrocardiography is the process of recording the electrical activity of the heart [Figure 1], over a period of time using electrodes placed on the skin. These electrodes detect the tiny electrical changes on the skin that arise from the heart muscle's electrophysiologic pattern of depolarizing and repolarizing during each heartbeat. It is a very commonly performed cardiology test.

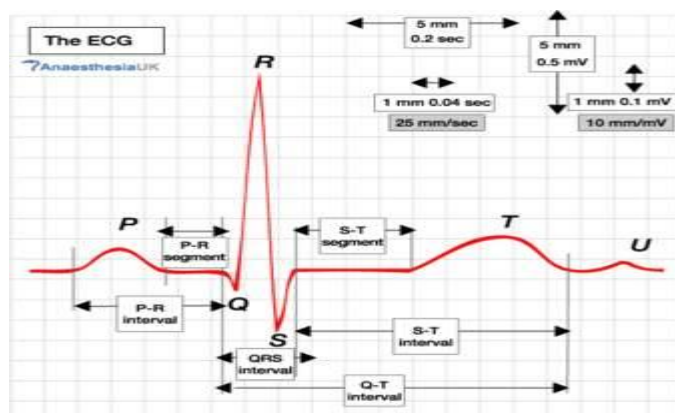


Figure1: The different waves of electrocardiogram signal (ECG).

ANALYSIS OF VARIABLES INPUTS

The characterization of heartbeats by descriptors is essential in the design and implementation of a cardiac abnormality model. In our case, we are interested in premature ventricular contracture (PVC) [Figure 2], which causes sudden death for patients, these PVC abnormalities are defined by:

- Their precocity compared to a normal ECG signal.
- An extended QRS complex of more than 0.12 s.
- Immediately followed by a T wave without a visible segment of RST.
- The absence of P-wave before the QRS complex.

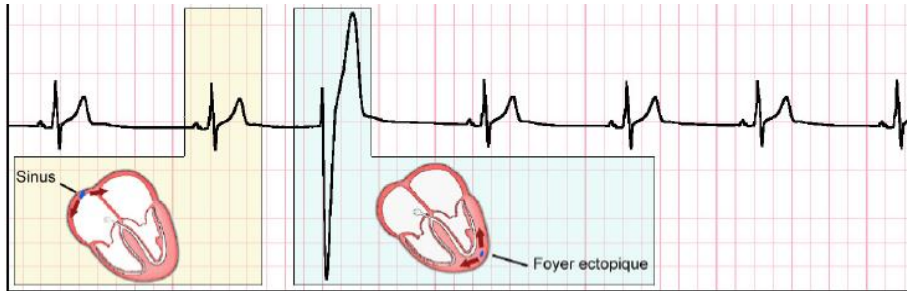


Figure 2: QRS broad in an electrocardiogram signal (ECG).

DATA BASE

Since 1975, the laboratories of Beth Israel Hospital in Boston and M.I.T have realized a MIT/BIH data base (MIT-BIH, 1992), which began to be distributed in 1980. This data base contains 48 records extracted from half an hour of ambulatory recordings of two ECG channels obtained from 47 patients studied by BIH arrhythmias laboratory between 1975 and 1979. 23 subjects has been randomly selected from a total of 4000 ambulatory records of 24 collected hours of a mixed population of hospitalized patients (60%) and non-hospitalized ones (40%) in the Beth Israel Hospital in Boston, the remaining 25 records were chosen from recordings that have a clinic signification in consideration of arrhythmias rarely observed.

Seeing that our data base is annotated, we have designed a matrix that contains many beats from well-selected records in order to have a maximum of examples for each category [Table1].

Parameters	Definitions
RRp	From the precedent R pic to actual R pic
RRn	From the actual R pic to the next R pic
QRS	Represents the QRS complex width
PP	From S to R
E	The Energy of ECG signal

Table 1: Significations of parameters that contain the data base.

CLASSIFICATION ACCORDING TO NEURONAL NETWORKS (MLP)

A Neural networks, is a set of algorithms whose design is at the origin very schematically inspired by the functioning of biological neurons, and which has approximated statistical methods.

The Multi-layer perceptron network was invented in 1957 by Frank Rosenblatt, and it consists of neurons linked together by weighted links. The Multi-layer perceptron is a lattice comprising (L) layers, and one or more hidden layers. Each neuron of one layer is fully connected to the neurons of the next layer [Figure 3].

The operation of the MLP network is as follows:

A neuron has inputs which can be outputs of other neurons, or inputs of external signals. The value of the output from the sum of the weighted input by the coefficients of this weighted sum.

The neuron state, also called activity, is defined as the sum of its inputs. The information is also transmitted in a unidirectional way (Rezaul, 2006).

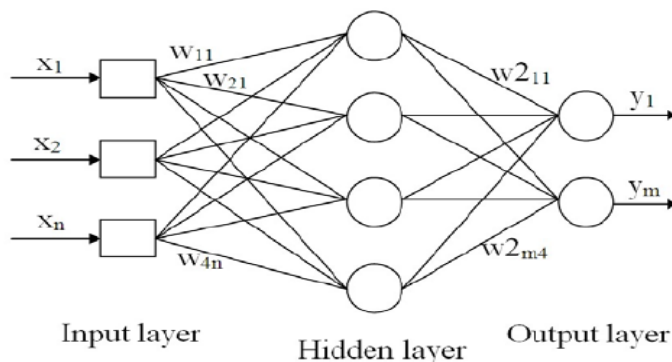


Figure 3: Diagram of the Multi-layer perceptron.

EVALUATION (MLP)

Knowing that our choice is focused on the gradient retro propagation algorithm, so a program is written in Matlab language for a software implementation of this algorithm. The chosen function is the sigmoid one.

The conception of a multilayer network is done experimentally, apart from the fact that there are some difficulties when choosing the number of intermediary layers and the number of neurons in each one of them. Concerning the input layer, it contains neurons as much as elements of input vector. Likewise, about output layer; it contains as many neurons as the number of classes (Normal, PVC). Thus, the input layer contains 6 neurons and the output one contains 2 neurons.

In order to determinate the number of neurons in the hidden layer, we proceeded as follows:

1. To prepare the cardiac cycles that correspond to chosen arrhythmia for the learning.
2. Create a network of neurons of which the number of input layer (respectively of output) is determined according to input vector (respectively classes in output).
3. To pick out arbitrarily a number of neurons in the hidden layer.
4. Detect a mistake of a very low value as well as the number of iterance.
5. Launch learning.

If the process keeps diverging, increase the number of neurons in the hidden layer, if this last one is too high, increase the number of intermediary layers.

Unfortunately, there is no "Super neuronal architecture". In other terms, a fixed architecture for which it would sufficient to adapt weights to this problem in order to get the best efficient results.

However, it should be noticed that this architecture is not unique and that there is often several architectures allowing getting the same efficiency. In our case, the optimal architecture is the one that has the smallest size. More precisely, the one that implies the least of calculation to realize the wanted function.

CLASSIFICATION OF SUPPORT VECTOR MACHINE (SVM)

SVM is a method for the classification of data; this supervised technical classification has been proposed in 1992 by Vladimir VAPNIK. The support vector machines exploit the concepts of the theory of statistical learning and the boundary theory of (Cortes, Vapnic, 1995). The intuitive justification for this method of learning is that if the learning sample is linearly separable it seems natural to separate the elements of the two classes perfectly so that they are as far as possible from the chosen boundary.

The success of this method is justified by the solid theoretical foundations that support it. They make it possible to tackle very diverse problems, including classification. SVM is a particularly well-suited method for processing data of very large dimensions, the general principle of operation of which is as follows:

Let a cloud of points of different natures, the objective is to find a decision boundary (hyperplane separator), which can separate the cloud of points into two regions by committing a minimum of errors, (find the optimal hyperplane) [Figure 4], shows that there are indeed several hyperplanes separators whose learning performance are identical (the empirical risk is the same). Whose generalization performance can be very different to solve this problem. (Vapnic, 1998), has shown that there exists a unique hyperplane (the optimal). It is defined as the hyperplane maximizing the margin between the samples.

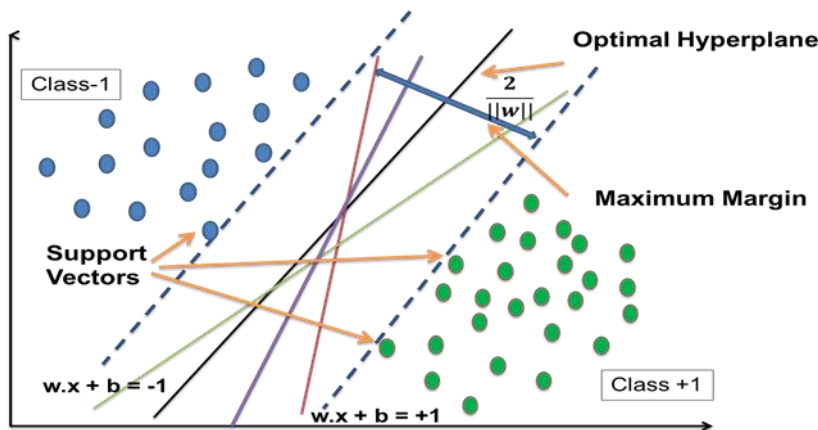


Figure 4: Method of Support Vector Machine (SVM).

EVALUATION (SVM)

The functions of the SVM method are as follows:

$$k(x, y) = \sum_{k \in N} \Phi_k(x) \cdot \Phi_k(y) \quad (1)$$

The decision function is given by the sign of the following discrimination function

$$f(x) = \sum_{i=1}^l y_i \alpha_i k(x, x_i) + b \quad (2)$$

α_i and b are coefficients to be determined, by maximizing the distance, called margin, between the decision boundary $f(x) = 0$ And point cloud in D . [Figure 4] for an illustration of these concepts, the problem becomes an optimization problem :

$$\min \left\{ 1/2 \|w\|^2 + C \sum_{i=1}^N \xi_i \right\} \quad (3)$$

C is a constant to be determined and ξ_i is the non-negative error.

$$Y = \sum_{i=1}^1 \alpha_i - 1/2 \sum_{i,j=1}^1 \alpha_i \alpha_j y_i y_j k(x_i, x_j) \quad (4)$$

EXPERIMENTAL RESULTS

The results presented in this study for the classification of ECG signals were obtained by applying the MIT-BIH database in the input of each ECG signal classifier and which are (MLP, SVM).

1-MLP RESULTS

After learning the MLP classifier, we obtained a confusion matrix [Figure 5], which gives us good classification states, as well as the cardiac cycles that have been confused (instead of being classified in the normal class, they were classed in the PVC class, and those of the PVC class in the normal class).



Figure 5: Results of Multi-Layer Perceptron (MLP).

A generation of the learning error of the MLP network is illustrated in [Figure 6], which begins with a high initial value and decreases throughout the learning phase, demonstrating the efficiency of the MLP method.

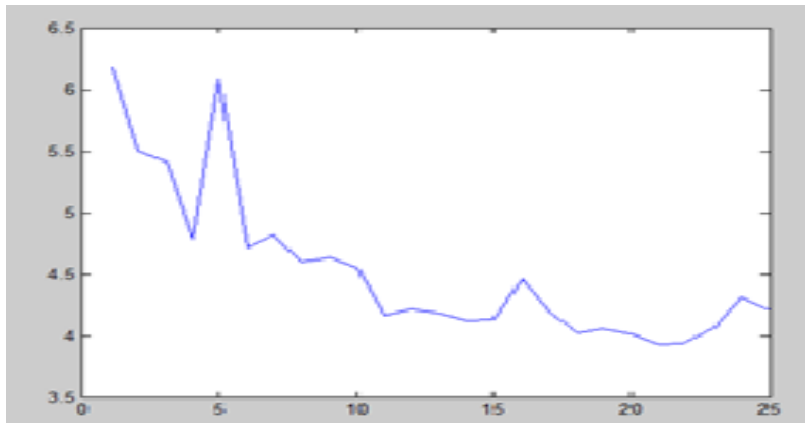


Figure 6: Diagram of Error (MLP).

2-SVM RESULTS

We have applied the SVM model, with the Gaussian kernel, by trying several values of the constant $C = \{0.5, 1, 1, 5, 2, 2, 5\}$. we concluded that the value of $C = 1.5$ gives better results by comparing the other values of the interval, the classification rates obtained are reported in [Table 2], an average classification result is 97.62 %, the result obtained on all patients in the MIT-BIH database. The study showed that the SVM results in terms of probability can be used to improve the classification decision. Electrocardiogram (ECG) methods of classification.

Database	constant C of the SVM	Sensibility	Specificity	Rate of classification
101	1.5	100	0	99,95
102	1.5	93.61	63.64	92.10
103	1.5	97.97	0	97.88
104	1.5	96.11	50	97.68
105	1.5	90.24	95.24	90.72
106	1.5	99.61	99.53	99,55
107	1.5	61.54	96.24	94,97
108	1.5	50.51	94.80	92.49
109	1.5	35.29	99.76	98.89
111	1.5	11.11	99.38	99.01

Table 2: Results of experiment.

Our classification system led us to obtain a recognition rate equal to 94.95% for the Multi-layer perceptron, and 97.62% recognition of the SVM model, on all the ECG records of the MIT-BIH database.

CONCLUSION

We have implemented a system of classification of cardiac rhythms based on the two learning methods, which are neuronal networks and SVM, dedicated to the diagnosis of cardiac arrhythmia.

Good results were obtained with a classification rate equal to 94.95% for MLP and 97.62% for the SVM, which favors the SVM algorithm. It is important to emphasize that each expert must justify his choice in each automatic method. The method we present gives more precision and allows classifying cardiac pathologies, which allows a better analysis of the signal ECG and represents a major constraint for the doctors in order to distinguish the PVC from other pathologies.

REFERENCES

- Abdelliche, F. (2011). Contribution au diagnostic des signaux ECG en utilisant les concepts des fractales. Thèse de doctorat, *Université Mentouri de Constantine*, faculté des sciences de l'ingénieur département d'électronique, Algérie.
- Cortes, C. & Vapnik, V.N. (1995). Support-vector networks, *Machine Learning*, vol. 20, no. 3, (pp. 273-297).
- Vapnik, V.N. (1998). Statistical learning theory, John Wiley & sons, New York.
- Chikh, M.A. & Benali, R. (2009). Reconnaissance des extrasystoles ventriculaires par la combinaison des réseaux de neurones et la logique floue. Laboratoire de Génie Biomédical, *Université Abou Bekr Belkaid, Tlemcen*, Algérie.
- Hendel, M. & Benyettou, A. & Hendel, F. (2016). Heartbeats arrhythmia classification using quadratic loss multi-class support vector machines, *International Review on Computers and Software (IRECOS)*, vol. 11, no. 1, (pp. 49-55), doi.10.15866.
- Impact of Technology in Healthcare Industry, 28 Janv. 2017, <http://learntechx.com/blog/impact-of-technology-in-healthcare-industry#>
- Moreas, J.C.T.B & Seixas, M.O & Vilani, F.N & Costa E.V. (2002). A real time QRS complex classification method using Mahalanobis distance, *Computing in Cardiology*, (pp. 201-204).
- Tsipouras, M.G. & Voglis, C. & Fotiadis, D.I. (2007). A framework for fuzzy expert system creation application to cardiovascular diseases, *IEEE Transactions on Biomedical Engineering*, (pp. 2089-2105).
- Exarchos, T.P. & Tsipouras, M.G. (2007). A methodology for the automated creation of fuzzy expert systems for ischemic and arrhythmic beat classification based on a set of rules obtained by a decision tree. *Artificial Intelligence in Medicine*, (pp. 187-200).
- Mateo, J. A. & Torres, J. & Rieta, J. (2011). An Efficient Method for Ectopic Beats Cancellation Based on Radial Basis Function, *33rd Annual International Conference of the IEEE EMBS Boston*, Massachusetts USA.
- Lachiri, Z. & Maatar, D. (2011). Classification Automatique D'arythmies par HMM utilisant les paramètres morphologiques dans l'ECG, Unité de Recherche Signal, *Image et Reconnaissance de Formes Ecole Nationale d'Ingénieurs de Tunis (ENIT)*.
- Triqui, B. & Behadada, O. & Benyettou, A. (2012). La détection des arythmies cardiaques par les chaînes de Markov cachées, *Editions Universitaires Européennes*. ISBN 978-3-8417-9540-3.
- Li, T. & Ma, J. & Pan, X. & Zhai, Y. (2017). Classification of Arrhythmia using Multi-Class Support Vector Machine, *Proceedings of the International MultiConference of Engineers and Computer Scientists (IMECS)*, (pp. 710-713), ISBN: 978-988-14047-7-0.
- MIT BIH Arrhythmia database directory. (1992). Third edition, *Harvard MIT Division of Health Sciences and technology*, Biomed. Eng. Center.
- Rezault, B. & Joarder, K. & Ruhul, S. (2006). Neuronel Neural Networks in Healthcare: Potential and Challenges. *University of New South Wales*, Australia.
- Yeh, Y.C. & Wang, W. J. & Chiou, C.W. (2011). Heartbeat Case Determination Using Fuzzy Logic Method on ECG Signals, *International Journal of Fuzzy Systems*, vol. 11, no. 4.
- Zeghoudi, A. & Benali, M.A. & Hadj Slimane, Z. (2010). Extraction de connaissances et classification des arythmies cardiaques par les réseaux de neurones, Laboratoire de Génie Biomédical, Département de Génie Electrique et Electronique, Faculté de Technologie, *Université Abou Bekr Belkaid, Tlemcen, Algérie*, 2010.

Mathematics Lessons within a Learning Environment Enriched with Teaching Materials: A Phenomenology Study

Nezih ÖNAL

*Department of Computer Education and Instructional Technology
Nigde Omer Halisdemir University,
Faculty of Education, Turkey
nezihonal@gmail.com*

Nagihan TANIK ÖNAL

*Department of Mathematics and Science Education,
Erciyes University,
Faculty of Education, Turkey
nagihanta@gmail.com*

ABSTRACT

The aim of the present study is to reveal the views of teachers and students regarding the impact of a mathematics course design enriched with teaching materials within the framework of the ADDIE model upon students' motivation towards the mathematics course. The research design employed in the study is phenomenology, which is one of the qualitative research methods. The participants in the study were selected by means of the criterion sampling method. As a result, the study was conducted with 29 volunteer students in grades 5, 6, 7 and 8 and their teacher at a secondary school in a village within the province of Nigde. The data of the study was collected by semi-structure interviews held with the participants. One of the findings that the present study yielded was the students' positive views about the use of the material in the mathematics lessons. The teacher who was interviewed in the study stated that since the very beginning of the mathematics lessons, both the concrete materials and the technology-enhanced materials in mathematics teaching had been effective in drawing students' attention and that implementing games and various other activities were more effective in making learning more permanent. In addition, the teacher reported that the use of materials in the mathematics class established a link between the educational objectives and daily life and, thus, prevented the formation of mathematical misconceptions. Thus, the teacher believed that the difficulties experienced in perceiving mathematical concepts could be overcome and eventually increase students' mathematical success.

Keywords: Teaching material, mathematics, teacher, student, phenomenology

INTRODUCTION

Implementing instruction enriched with materials and various activities will have a positive impact in terms of effective and permanent learning. Teaching processes supported with teaching materials not only prepare students for open and inquiry-based environments but can also provide them with the opportunity to study freely (Arslan, 2003; Bedir, 2005; Gürbüz, 2007; Önal, 2010). In addition, lessons supported with teaching materials can be helpful students to discover very different ideas that many teachers may not be able to think of (Dede ve Argün, 2003). As students can experience difficulties especially in relation to many abstract concepts, particularly in mathematics classes, it is important to prevent this by means of instructional materials that assume the role of concretizing and making learning permanent. Apart from the educational environments in which it takes place, learning is under the influence of numerous factors, such as educational tools, instructional materials and external factors. Vural (2004) visualized some of the factors impacting learning as in Figure 1:

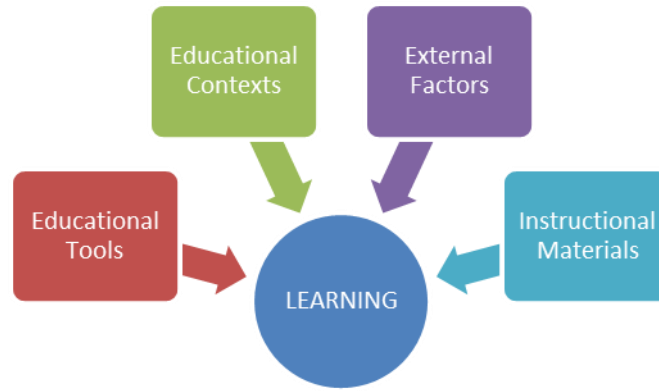


Figure 1. Some factors impacting learning

According to Figure 1, it is possible to maintain that for learning to take place, educational environments, educational tools, instructional materials and external factors each function as a channel. It is believed that the impact of each channel used to teach any content within the learning process is important. It is known that among these factors, educational tools and instructional materials are used to support and facilitate instruction. Hence, we can assert that well-designed instructional educational tools and instructional materials will facilitate not only the enrichment of educational processes but also the increase in the level of learning. At this point, it is possible to mention the discipline of instructional design, which deals with to whom, when, where, how, how much, and why a content area should be taught within a teaching and learning process. Instructional design is a systematic and reflexive process that enables the adaptation of learning and teaching methods to instructional materials, activities and evaluations with a systematic plan. The models to be used within this process has a significant effect on the impact and functionality of the products to be created. In general, the instructional design model can facilitate the visualization of the steps involved in the teaching environment which cannot be noticed easily. The findings of a study by Göksu, Özcan, Çakır and Göktaş (2014) indicate that instructional design models, specifically when used in the fields of “Computer and Instructional Technologies,” “Science” and “Mathematics,” increase students’ levels of academic success, motivation, self-confidence and permanency in learning, and have a positive effect on students’ attitudes and approach towards the lessons. For this reason, in the present study, a learning environment enriched with instructional materials was designed by using the ADDIE model, which is one of the important instructional design models implemented with the consideration of the field of mathematics and the systematic approach.

THE STUDY

The Research Design

In this present study phenomenology which is one of the qualitative research methods was employed. In a study based on a phenomenology research design, participants describe their experiences related to a phenomenon (Creswell, 2013).

Participants

In this study, participants were selected by means of the criterion sampling method, which is purposive sampling, one of the sampling methods in qualitative research. The study was conducted with randomly selected 29 volunteer students in grades 5, 6, 7 and 8 and their teacher at a secondary school in a village within the province of Niğde. The data of the study were collected by means of semi-structure interviews held with the participants. The fact that the students and the teacher in the study group using the instructional materials in the research were doing so for the first time at a village school was regarded as one of the strengths of the research.

The Data Collection Tool

The data of the research was collected by means of semi-structured interviews held with the participants of the study. Semi-structured interviews are conducted by means of pre-prepared questions with the aim of collecting similar kinds of information from the participants by addressing similar topics (Patton, 2002). Accordingly,

interview forms entailing the semi-structured interview questions were constructed prior to the interview.

Procedur

The administration of the school where the study was conducted and the mathematics teacher were contacted to receive their opinions regarding the establishment of a mathematics class within the school. Subsequent to the observations and needs analysis study, expert opinions were received and the class was established. In this class, three dimensional instructional materials prepared by the students in the Primary Mathematics Teaching Department of a state university in their Instructional Technologies and Materials Design course. The steps followed in the study within the framework of the ADDIE model are presented in Figure 2:

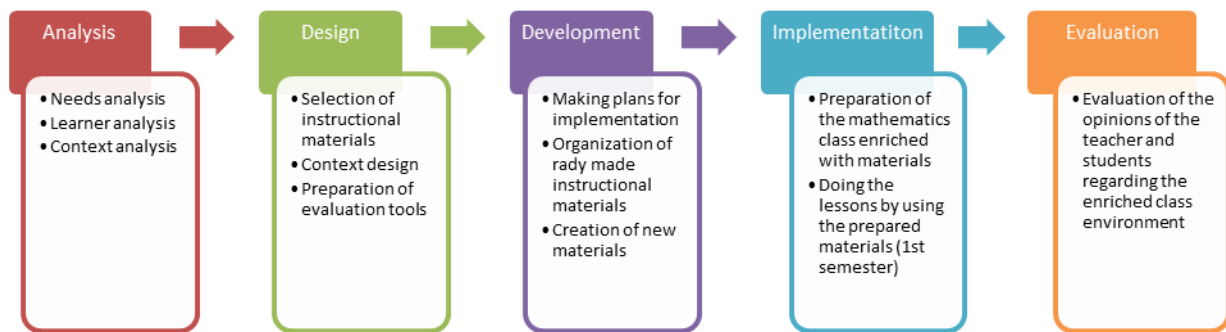


Figure 2. The steps followed in the study within the framework of the ADDIE Model

Data Analysis

The data obtained from the semi-structured interviews were analysed using content analysis method. The aim in the content analysis method is to arrive at concepts and relationships that can account for the data collected in the study. To this end, the data collected should first be conceptualized, then arranged logically according to the concepts that emerged and based on this, the themes that explain the data need to be determined (Yıldırım and Şimşek, 2008).

FINDINGS

The Teacher' Opinions

In order to determine students' level of success in the mathematics class, the teacher was initially asked the following questions:

"How successful do you think your students are in mathematics when compared to the average level of success in Turkey? Why do you think so? What may be the reasons of this situation?"

The teacher expressed his/her opinions in response to these questions as follows:

"My students' level of success in mathematics is low when compared to the average level in in Turkey. The school where I work at is a village school, and my students' economic status and level of family support are insufficiently low. Naturally, these factors are obstacles preventing students from making progress."

It can be deduced from the teacher's response that the she believes her students' success in mathematics is low and account for this with having a low economic status and a low level of family support. According to the teacher, the students need to receive material and nonmaterial family support in order to be successful in mathematics education with a level that is above the average success level in the country. It is striking that, while expressing his/her opinions, the teacher did not mention the abstract nature of mathematics, and such factors as students' interest and motivation.

The teacher stated that the use of materials were effective, particularly with some mathematics topics, when he/she was asked the following questions:

"Do you think the hands-on, three-dimensional materials prepared in accordance with the teaching objectives influenced your mathematics teaching process? If so, in what way was it influential? Why do you think so?"

The teacher gave the following responses:

"It is essential and effective to present some topics by using materials. For example, when geometrical objects such as prisms, pyramids, and spheres are drawn on the board, their angel or the number of faces, edges or bases they have are perceived only partially. Only when these counts and presentations are made by using materials can these shapes be clearly visualized in students' minds understand these numbers."

The teacher believes that visualization has a permanent effect on learning. In addition, the following response of the teacher indicates that the instructional materials prepared have a positive effect on mathematics education:

"I came to possess numerous materials thanks to the mathematics class we constructed at my village with the mathematics education students in university (laughs). When I took these materials to class to present some topics, the students were motivated to use them as they had never seen them before."

The teacher was also asked whether he/she preferred to use such materials as technological products and the Internet. He/she responded by stating that he/she used the interactive boards while students watched videos or solved problems. He/she did not mention the use of such technological products as computers, tablets or projects in mathematics education. Subsequently, when the teacher was asked by the researcher whether he/she used Web pages during mathematics education, he/she stated that he/she followed some mathematics teachers' groups on Facebook and used their questions from time to time. The exact utterance of the teacher was as follows:

"Yes I use them in class. I prefer to use the explanations of mathematics teacher groups (the blogs of Ahmet Hoca and Serkan Akca) on Facebook as they are good and their test questions as they are of moderate difficulty level."

When the teacher was asked whether he/she made use of a computer software in his/her mathematics class, he/she gave the following response:

"I tried using the Geogebra software, but since it was in university when I [last] used it, I couldn't remember the last content section. Even if I heard about other software programs, I did not get the chance to find and use them, but I would prefer to use them."

Finally, the teacher was asked to express his/her opinion regarding how a mathematics teacher could be a better teacher. The teacher responded as thus:

"The teachers and teaching styles in mathematics subjects offered to students at schools are better than it was in the past and more importance is given. However, bias towards mathematics still continues to exist. With these opportunities, the very first thing that must be done is to eradicate this bias."

This opinion of the teacher is quite significant. The teacher, who had not mentioned the impact of students' biases towards mathematics as one of the reasons underlying their failure in the mathematics course, stated this time that these biases needed to be eliminated. However, when the teacher was asked how these biases could be eradicated, the teacher responded by saying, *"I don't know."*

The Students' Opinions

The findings which the analysis of the questions posed to students in order to determine students' opinions about mathematics education within an environment enriched with instructional materials were compared with those of the instructors and are presented below.

The students stated that, in general, these materials had a positive impact on their mathematics learning process, that they learned the topics more effectively and that their interest in the subject increased. The findings based on the students' opinions are presented in Table 1:

Table 1. Students' opinions about learning mathematics within an environment enriched with instructional materials

Positive opinions	Students	Frequency
It made the lesson enjoyable.	S1, S2, S3, S9, S15	5
It added variety to the lesson.	S1, S11, S28	3
It enabled us to like mathematics more.	S1, S 2, S 12, S 13, S 16, S 20	6
It made the lesson better.	S1, S 2, S 15, S 25, S 28	5
It enabled me to understand the topics better.	S5, S7, S13, S17, S20, S21, S22, S23, S24, S26, S27, S28, S29	13
It increased my motivation.	S6, S8, S9, S10, S12, S14, S18, S19, S20, S23	10
It facilitated visualization and comprehension.	S16, S17, S18, S19, S20, S21, S22, S23, S29	9
Neutral Opinions	Students	Frequency
Solving problems on the board is sufficient.	S4	1

It can be observed in Table 1 that except for S4, who stated that these materials did not impact their interest in the lesson, and that it was sufficient for them to solve questions using colored markers on the board, all the students stated that these materials had a positive influence on their education. In order to gain more insight into the students' opinions, the students were asked to express both the positive and the negative aspects of these materials in mathematics education. The findings that the analyses yielded are presented in Tables 2 and 3 below:

Table 2. Students' positive opinions regarding the use of educational tools and materials during instruction

	Students	Frequency
Then facilitate learning.	S2, S7, S8	3
They facilitate comprehension.	S3, S5, S10, S12, S15, S16, S17, S21, S24, S25, S26, S27, S28	13
They make lessons enjoyable.	S4, S6, S9, S10	4
They increase motivation towards the lessons.	S4, S11, S15, S19, S23, S27	6
They increase participation in the lessons.	S6, S20, S21, S26	4
They made visualization possible.	S22, S23, S28	3

Table 3. Students' negative opinions regarding the use of educational tools and materials during instruction

	Students	Frequency
When misused, they can break apart.	S1, S2, S22, S23, S26	5
They are not appropriate for every topic.	S4, S13	2
They can create noise.	S6	1
Using them sequentially can be time consuming.	S7	1

Accordingly Table 3, it can be observed that the students believe that a mathematics course enriched with materials facilitates understanding the lessons, makes the lessons more enjoyable, and increases participation in the lessons. On the other hand, they also stated that they could lead to negativities such as the creation of noise during their use or their breaking down.

Based on the positive opinions regarding the use of educational tools and materials in mathematics courses, students were asked whether they preferred these materials to be used by the teacher or the students. As can be clearly seen in Table 4, the majority of the students want to make active use of the materials themselves.

Table 4. Should materials be used by the teachers or the students?

My teacher should use them.	Students	Frequency
Our teacher knows best.	S1, S2, S3, S7, S10, S11, S14, S18, S22	9
I use	Students	Frequency
It will increase my participation in the lessons.	S4, S5, S6, S8, S9, S10, S12, S13, S15, S16, S17, S18, S19, S20, S21, S28	16
The teacher and students can take turns to use them or use them together.	S4, S23, S24, S25, S26, S27, S29	7

S19, expressed his/her opinions as follows:

“It would be better if I used the educational tools and materials used in class. They will increase my participation in the lessons because when my teacher uses them, I may not see and feel them clearly and thus they won’t draw my attention...”

Similarly, S20 said, *“If I use them, it will increase my participation and interest in the course because when I do it myself, I both learn and understand better.”* When the students’ opinions are taken into consideration, it can be understood that they have positive opinions about the use of instructional materials in mathematics education and that they want to be active during the use of these materials.

CONCLUSIONS

It can be concluded in the present study, which aimed to reveal the opinions of both the teacher and students as regards students’ interest in the mathematics course based on a mathematics course design enriched with instructional materials within the framework of the ADDIE model, that generally the participants of the study expressed positive opinions regarding the use of materials in the mathematics class. The students stated that the use of materials in the mathematics course was beneficial in visualizing the topics, in enabling them to understand the concepts more effectively, and in increasing their interest and love towards the course. This conclusion is consistent with the explanations made by Çelik (2007) in that concrete materials facilitate students’ learning and teachers’ teaching processes and that materials enriched educational processes and added depth to the topics. On the other hand, some of the participants claimed that the use of materials caused noise in the classroom, that it could sometimes be time consuming and that they were not always suitable to the topic or they could break down or fall to pieces.

It is of utmost importance to adopt an understanding of mathematics education which is student-centered, which can be implemented in an environment in which students can fearlessly express their opinions, which can give everyone the opportunity to develop their own thinking strategy and that effectively establishes a link between daily life from the very first day of school. In this way, contributions can be made by raising individuals who can overcome their biases and think mathematically to solve problems. Improvement in mathematics education would impact the whole society (Umay 1996).

The teacher who was interviewed in the study stated that since the very beginning of the mathematics lessons, both the concrete materials and the technology-enhanced materials in mathematics teaching had been effective in drawing students' attention and that implementing games and various other activities were more effective in making learning more permanent. In addition, the teacher, who reported that the use of materials in the mathematics class established a link between the educational objectives and daily life and, thus, prevented the formation of mathematical misconceptions, and thus, the difficulties experienced in perceiving mathematical concepts could be overcome and eventually increase students' mathematical success, stated that he/she was going to continue to use the mathematics class effectively. Based on the findings of the present study, it can be recommended that especially in numerical classes such as mathematics and science, which frequently entail abstract concepts and which students generally approach with biases, the use of materials should be increased, and learning environments in which students can have first hand experiences with materials that are in accordance with their interests and developmental attributes and in which they can actively participate should be made more widespread.

REFERENCES

- Arslan, B. (2003). Bilgisayar destekli eğitime tabi tutulan ortaöğretim öğrencileriyle bu süreçte eğitici olarak rol alan öğretmenlerin BDE'ye ilişkin görüşleri, *The Turkish Online Journal Of Educational Technology*, 2(4), 67-75.
- Bedir, D. (2005). *Bilgisayar destekli matematik öğretiminin ilköğretimde geometri öğretiminde yeri ve öğrenci başarısı üzerindeki etkisi*.Yayınlanmamış Yüksek Lisans Tezi, Dokuz Eylül Üniversitesi Eğitim Bilimleri Enstitüsü, İzmir.
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Çelik, L. (2007). *Öğretim materyallerinin hazırlanması ve seçimi*. Ö. Demirel, (Ed). *Öğretim teknolojileri ve materyal tasarımı*. Ankara: Pegem A Yayıncılık.
- Dede, Y. & Argün, Z. (2003). Matematik öğretiminde elektronik tabloların kullanımı. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 2(14), 113–131.
- Göksu, İ., Özcan K., Çakır, R. & Göktaş, Y. (2014). Türkiye'de öğretim tasarımı modelleriyle ilgili yapılmış çalışmalar. *Elementary Education Online*, 13(2), 694-709. [Online]: <http://ilkogretim-online.org.tr>
- Gürbüz, R. (2007). Olasılık konusunda geliştirilen materyallere dayalı öğretime ilişkin öğretmen ve öğrenci görüşleri, *Kastamonu Eğitim Dergisi*, 15(1) 259–27.
- Önal, N. (2010). *Meslek yüksekokullarında görev yapan öğretim elemanlarının öğretim materyallerini kullanım düzeyleri (Kırşehir İli örneği)*. Yayınlanmamış Yüksek Lisans Tezi, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.
- Vural, B. (2004). *Eğitim-öğretimde teknoloji ve materyal kullanımı*. İstanbul: Hayat Yayıncılık.
- Umay, A. (1996). Matematik eğitimi ve ölçülmesi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 12, 145-149.
- Patton, M. Q. (2002). *Qualitative evaluation and research methods*. (Third Edition). Thousand Oaks, CA: Sage Publication.
- Yıldırım, A. & Şimşek, H. (2008). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin Yayıncılık.

Media-Text - As Powerfull Means of Mass Media

Esenova O.KALBIKE

*Doctor of philological sciences, associate professor
Abai Kazakh National Pedagogical University*

Amirbekova B.AIGUL

*Candidate of philological sciences
Institute of Linguistic Research named by A.Baytursynuly*

Seidaliyeva O. GULDANA

*PhD, Senior Lecturer
Kazakh State Women's Teacher Training University*

ABSTRACT

Media-text is a pragmalinguistic term, which is considered as a compound term. It is not only a linguistic unit, but also general knowledge in the communication sphere. Therefore, in recent years, the study of media texts within cognitive linguistics has become of great importance. Here, language is considered as a presenter of external information, as well as cognitive tools to be used for disclosing the meaning encoded in the information. It is also important to determine what the language means within the ideological orientation of media texts. Consideration of information with socially relevant content transmitted through verbal means, in a broad sense with extralinguistic factors, namely, the human factors is also important. In connection with the society, in social linguistic environment, there is a requirement for the fundamental branches of science. Today it has been developing in the anthropocentric direction. Since, the focus of our research is on human being, who is the creator of media texts (journalist), and the recipient (the reader), the object, as well as due to the fact that the subject matter covered and the value of human problems. Therefore, relevance of this research work is that it is necessary to study the main factors affecting human beings from psycho-social and pragmalinguistic aspects.

INTRODUCTION

Unofficially, mass media is found as the fourth power of the authority in the society. The mass media plays a critical role in the current information century. Professor R. Syzdykova states that the fiction style has a dominating role in developing the Kazakh national written literary language: "No doubt, nowadays, we can recognize the state from what role publicity plays. Mass media – the press, radio and television has strengthened practicing languages. In spite of everything, Kazakh fiction, especially its prose, is still not going to yield its leading and exemplary position" [Syzdykova R 1986]. Nevertheless, the publicistic style of fiction is called functional item. It has become one of the main functional styles, especially, during the last decades of this century with the increase of social consciousness as well as legal and political consciousness, and rapid development of technical and electronic devices [Zhmagulova M 2005]. People use mass media first to pursue their interests. After getting rid of the Soviet censorship, the mass media sometimes seems to be turned into the privacy of specific organizations or celebrities. On the other hand, it is thought that the mass media is broadcasting different problems in all spheres of the society. Nowadays, it is not a secret that the mass media is concentrated on those social issues that it finds to be important by itself. Particularly, during the pre-election campaign, it is considered to be of state importance for the introduction of the real purposes and objectives of the legal personalities by the mass media. It is well known that there are three types of means of mass media: television, radio, and periodical press.

The broadcasted text on radio is accompanied by soundtracks, while the periodical press text (newspaper and journals) is particular to its graphic designs. The perception of texts mentioned above is realized by three channels: television text is perceived with the help of audio and video tracks, radio text is understood only in audial way (by hearing) and periodical press materials (in spoken language “dead text”) is perceived only by visualization (it is read). Despite such a precise distinction between all the messages disseminated by the mass media, there are compiled a set of verbal and medial symbols, which all together provide a meaning to the term media text. In Russian -Kazakh dictionary, the term „media“ is defined as the means of mass media [Russian-Kazakh dictionary 2005]. The contextual composition of the press, radio and television programmes, information consists of two principal parts: factual and influential. The national mass media programmes attach great importance to information content and information influence. In many cases, too much importance is attached to influencing and convincing means of the information. This approach has been still kept in modern periodical press.

The mass media text should be considered as a linguistic unit, as well as a communicative presage in the content of general education. In recent years, the media text is found significantly in the content of cognitive linguistics. Language is used as cognitive instrument to recast outside information and decode the enciphered message of the text, as it is essential for the cognitive linguistics specialists. Information space established by the mass media is created on subject principle, because of the specific peculiarities of the media courses that are reflected in that space. In researching media text, it is significant to define what linguistic approaches should be used to express ideological orientation. Contemporary mass media researchers, to be more exact media communication researchers, still cannot give the definite answer to the question - what the stylistic status of the language is, because the functional and stylistic distinctions of the media language have not been clearly defined yet. For instance, designations appropriate to general publicistic style cannot be obligatory and commonly referred to all types of mass media.

The printed materials of a periodical press have passed several stages of stylistic editing. But, it is impossible to control the information disseminated by television or radio constantly. For instance, it is difficult to evaluate language style of the reporter during the on-the-spot report from different sports competitions, cultural events and political affairs of broadcasted life.

Thus, it is clear that the complexity of the media language and its stylistic diversification complicate the research on media language. Professor Yu.V. Rozhdestvesky stated: “Difficulty in researching the media caused not only by the fact that there is no tradition of a special study of mass media, but also by the special complexity of the subject, that is, mass media. The complexity of the media involves: firstly, the media information text is created collectively and collegially, and secondly, the media information encompasses and embraces its content of all other forms and varieties of a spoken and written word. The characteristics of the spoken word, literature and writings are included in the media. Thus, the media is an integrated text in its way of creating and comprehensive oral and written sources [Rozhdestvesky Yu 1997].

Actually, the reason for this difficulty is the classification of a language for functional and stylistic distinctions has not been given yet. It is reasonable to say that this problem is caused by the researchers’ need to follow different concepts, refer to different criteria in classifying functional styles and their subgroups. So, each researcher chooses the concept according to his research purposes regarding the use of language in grouping reasonable facts. D.N. Shmeleyev writes: "There is no reason to think that using a particular criteria; therefore, we are in conflict with all other concepts of styles and other principles of grouping functional varieties of language. Apparently, we can properly assess the relevant proportion of different criteria fairly by illuminating diverse aspects of this multifaceted problem in various ways”

[Shmeleyev D 1977].General media communication is considered to be an important field of social activity in public practice. Due to this importance, the typical distinctions of media communication can be the basis for the word usage peculiarities in the above-mentioned sphere. This is primarily because media texts are collegial, cohesive and focused on scattered located extensive audience [Dobrosklonckaya T 2000].

However, from one side the integrity and unity are inherent to the media language and its thematic composition is also stable. From another side, functional and stylistic diversification demonstrates thematic universalism of the mass media. The difference of the word usage in the media text is that it is open to the amendments and adjustments, unlike other industries.

The researchers draw their attention to two problems in determining the status of the media communication language: 1) the recognition of the media language as a developed, independent stylistic composition with its place in different functional stylistic systems; and 2) determining the internal functional and stylistic ranging of the mass media language [Dobrosklonckaya T 2000].

It is natural that the mass media concentrates on newspaper language, mainly because of two reasons: first, the newspaper is the oldest form of the mass media. Therefore, the principle stylistic approaches and methods unique to the media communication had already been worked out. Second, the newspaper language is very convenient for linguistic research, and necessary materials are available at any time. Hence, they are not required to be recorded in advance and broadcasted, like radio and television materials. Unlike other mass media recourses, the newspaper text is voluminous and large-scaled. In summary, the mass media consists of the *journal, radio, television, movies* and the most effective means of communication with the mass population – a *newspaper*. Mainly because the newspaper is acceptable at any time, the information is voluminous, topics are diverse, all newspaper series are convenient for the reference and its format is comfortable. Despite the television and the internet have conquered the whole globe, the newspaper still remains important.

As for the mass media, it is a renewed form of the media communication, which plays an important role in intercultural communication. Mass media becomes an integral part of the life for the mass population that disseminates different types of information. So, the mass media is the forth form of the authority informally. With the help of the mass media, different influences are made on the society. It imposes some perceptions about policy, economy, and culture and makes superiority. Therefore, the mass media acts as a mediator between the information sender and receiver. Despite there is an official state language, the media language possesses some distinctions. It provides the mass media with necessary tools to realize its main functions. It also increases the linguistic scientists' interest to the problem. Kazakh as the state language is rich for its content and format for the Kazakh media language. The researcher A. Aldasheva explained while making the decision in her work about the contemporary media language genre and stylistic distinctions: "In general today old newspaper language, clichés, the majority of terminology, special vocabulary specific to the media language are not used in the contemporary media language. Instead of those, the expressive and emotive vocabulary, proverbs and sayings, stable word combinations and popular expressions, as well as simple language and language personalities typical to spoken language are often used. Other stylistic language elements are frequently used in newspaper language. The change and influence of stylistic elements to another style is called interstylistic diffusion. This sort of interstylistic diffusion takes place in Kazakh publications [Aldasheva A 1999].

THE STUDY

There are different viewpoints in understanding the notion "text meaning" among researchers. One group of researchers relates to the meaning of the text to its main idea [Luriya A 1975], while another group of researchers mainly draw their attention to two elements of the text: meaning and situation [Kolshansky G 1978]. Also, there is another group of researchers who define two types of the meaning: an abstract meaning and a general meaning. Now, it is worthy to consider the notion of "*personal meaning*" by A.N. Leyontyev [Leyontyev A 1977].

An addresser expresses his viewpoint about the natural existence in the text step by step, and an addressee perceives and considers the autho's idea through his inner world creating his own "personal meaning" about the text content.

Basically, the personal meaning, not the general meaning helps the addressee to understand the content of a world. It helps the person to realize the real importance of everything in this world. Consequently, the interrelation between the person and existence takes place due to interaction of the meaning and the recipient and the “meaning” acts as a mediator. Furthermore, the existence is formed in person’s mind as a media shape of the universe.

This formation of the text represents the content in person’s mind: the meaning of the media-text appears between the link of recipient’s imagination and the reality. Communication between the mental representations of recipient’s mind and symbolic components of the media-text, its occurrences and situations help to improve the meaning of the text. That is why we can make a conclusion that without a connection to the text and recipient’s imagination, the meaning of the text is lost [Peeschalnikova V 1991].

Mostly, the media-description of the world which represents people’s informational actions is full of dynamism, and is very changeable. Presently, personal, informational actions are divided from other activities, and are being developed. Informational service, including natural truth, can make an extraordinary media-truth. Media-truth is made from media-texts, which are published and circulated by different types of mass-media. Media-texts make the truth like a thing, for this matter they need a space. It is called a “*media-space*” in a scientific literature. While perceiving the media-texts, the media-truth is changed into one part of a person’s truth, leading to the appearance of a variety of changes in a society.

Furthermore, it depends on the following two systems – the connection of symbolic and mental systems, which helps to make different variants of interpretations of truth. So, the media-text maker can choose any variants of representations, and the recipient also has a chance to make different interpretations of the text. Generally, it is known that person’s mind perceives the world not as a whole thing, but like the little parts of pictures; therefore, the fantasy of the person is free. This freedom gives a big opportunity to manipulative communication. In other words, the meaning of manipulation is a change. At present, there is no stable conception that can explain the mechanism of manipulation. In order to achieve this manipulation, researchers explain its mechanism as follows:

Illusions, which are created by the laws of perception (i.e., the distance between a person and a white thing will seem close to each other, but the black thing will seem far away. And the thing which is situated on the left side of the person will also seem bigger than the thing on his right side). These kinds of illusions are used to place the information on the perceptive space.

The effect of unconsciousness to the person’s character. Here, manipulation is achieved with the usage of national, religious, and political symbols.

Manipulative technologies at the personal level: managing information, giving effects of manipulation in a hidden way, using force, manipulating to interest somebody, etc.

To consider person’s brain as a computer that has its own special programme [Akhatova B 2000].

Generally, the main function of the mass media is to report or broadcast variety of information to the audience influence people using this information. Moreover, in order to achieve this kind of effect, the authors of media-texts use different language methods. According to traditional value system and using its right, good and bad rules, authors educate people as readers.

We can observe that in the aim of achieving pragmatic aim, the authors of newspaper texts do not often use good or right methods while writing. In order to persuade his audience that the idea is right, an addressee can make changes upon the world’ language picture, which is fixed in the reader’s cognitive mind. Language methods that used for the sake of the author are divided into two groups:

- 1 Language methods;
- 2 Language approaches.

The first group includes language units that are well known and used by authors actively. The second group includes the methods that are directly used by the recipient in a hidden way, and they are also used to realize incorrect actions of some individual groups. All the methods that belong to the second group are called “*language manipulation*”. But, in the research that are written in Kazakh language, we have never met such kind of methods. Hence, when we use this occurrence according to the materials of media, they are called “*language means*”. The meaning of the notion “*language means*” relates to the meaning “*ruse*”. These language units are used in giving bad meanings of the text. Nevertheless, we cannot see such kind of bad meaning in the context and semantics of the notion “*approach*”.

Language manipulation, at first, is directed to make changes to the linguistic picture of the world, which is fixed in the recipient’s cognitive mind and its elements. In our society, reader’s mind is manipulated verbally and non-verbally by different means of mass media. In politics, manipulation is aimed and used to make an ideological fight against people [Sabato and Simpson 1996]. According to an explanatory dictionary of literature, manipulation is an ideological, social and psychological system which can change person’s point of view and observe person’s actions [Short dictionary on sociology 1988]. Webster’s dictionary explains that manipulation is a tool which gives people wrong information and exerts pressure on them [Webster’s New Encyclopedic Dictionary 1993]. Manipulative language appears as a new notion in mass media, which has its own system and structure. We can see all phonetic peculiarities and symbolic levels of a language, from morphemes to the text in manipulative language. In order to understand texts correctly which are used in mass media and to make their interpretation, the recipient should deeply understand not only the linguistic aspects, but also the extra-linguistic realities of the text. If the recipient does not understand the text, he can be an object of a manipulative effect. A.A.Lyubimova explains that language manipulation occurs in all its levels, for example, in phonetics (sound symbolism, the usage of prosodic means: the rhythm of the text, intonation structure); in lexis (the change or the spoil of reference, the usage of euphemisms and dysphemisms, the change in an associative line, lexical groups under the pragmatic weight, the usage of the texts in mass media which do not have any meaning); in grammar (the usage of a model category with the purpose of pragmatic aim, i.e., showing the true case as it does not happen in reality) [Lyubimova A 2005]

RESULTS

The main *aim* of our article is to determine the spoiling of the world’s language picture and value system because of the language rules in present day, especially in Kazakh newspapers. In defining the ways of linguistic manipulation of the mind the following criteria must be used:

I. The first criterion - the principle of reference, it means the connection with the truth. Manipulating the mind can lead to change the true, real facts. Sometimes it is difficult to define manipulation because the facts are determined by the addresser’s and the addressee’s point of view. That is why in order to evaluate and interpret the material about the important historical or political occasions in mass media; we should take texts from international, official and state documents as an objective direction.

II. The second criterion – linguistic alterations have meaning of the usage of not correct structures in text writing. Linguistic alterations also include the change of lexical and syntactical meaning of the word from the standard. That is why such kind of structures might have a manipulative meaning.

III. The third criterion – the frequency of usage, i.e., if one journalist uses just only one method of manipulation, there will not be any sign of manipulation. This author’s usage should be called stylistic peculiarity. But the usage of the word expressions which are not directed straight to the language or exact case in few articles of journalists of different informational newspapers are considered methods of manipulation. One manipulative method can be used several times without any change, or it is repeated in exact variants.

In determining the methods of manipulation of the mind, we should take into consideration these three criteria: reference, linguistic alterations and frequency of usage.

The meaning of the media-text is more significant than the media-text on the newspaper itself, and the meaning can influence the mind of the recipient. Also, the meaning can change recipient's conceptual world picture which is fixed in his mind, and it influences on the opinion of the recipient correctly or incorrectly.

From this we can make two inferences about a regulative (regulative, influential) meaning of means of mass media:

With the help of mass media, the symbolic space of the meaning of the media-text is broadcasted from the press (i.e., from exact things which we can see - from newspapers or on TV) to the second mental recipient of the text. It means that symbolic space (media-text) is transformed to meaningful space, i.e., to the recipient's mind.

With the help of mass media, media-text is manipulated, and then the meaning of the text is transformed to millions of recipients' mind. And hundreds of recipients' mind is also informed about the meaning of the media-text.

Now we would like to write about the problem which is occurred by the influence of the mass media on the people's mind, exactly, the usage of the media-text as means of social regulation. R. Jakobson divides six functions of the language according to its directions while communicating: addresser-addressee-referent - information-communication-code [Yakobson R 1975]. Communicative (referentive, denotative) function is close to referent, emotive/expressive function is realized by the author of the information; phatic function is used to make communication, professional language function is used to open and explain the code, poetic function makes information work it [Sheyigal 2000].

R. Jakobson gives the name to the function that is directed to the addressee like connotative or appellative. Also, we come across with the terms as "voluntarily", "vocative" function in a scientific literature, and these terms mean the aims of the addresser, his intentions and his influence upon the addressee. From these terms that are mentioned above we can use the most important function as a suitable variant for writing the media-text. It is a regulative function that is created by Mechkovskaya. Because this feature means the role of language which is used in regulating (forming) addresser's character. The influence on addressee's character can be realized in different ways: to make actions, to answer questions, to prohibit doing some activities/actions or with the purpose of changing addressee's intentions by giving different information and etc. And media-texts use this regulative function of language in the means of mass media.

All over the world the appearance and results of the informational technologies and their quick developments are influenced by the processes which are related to the life of the world association, and these processes are also developing quickly. These kind of processes are seen like the media-picture of the world's huge picture which is made by the means of mass media [Rogozina 2001a].

The notion "social interrelation" can be defined as a text exchange that represents the existence in different ways. The mass media is the system that provides the interexchange within the text to diversify the individuals' universe shape. Differently expressed extracts of the existence that influenced the person and improved his individual universe shape that represents the positive results of the communication. The representation in either oral or written text form sent to the mass media. The impact is increased for several times with the help of technical devices. It is well known today all human being turned into the impact entity of soft mass media. The media text as the universal instrument of any types of mass media acts as a social regulator. Different mass media uses a particular media text, but the general characteristics remain unchangeable. In general the notion "text" can be interpreted in various ways. Because, the size of the text is changeable, unstable. Second, forms and ways of using and distributing are also different.

The changeability of the text size depends on the presence of several sentences, newspaper articles, or voluminous novels. The television interview is an oral form of the text, and the newspaper text is printed (written) one, the soft mass media text is called virtual [Rogozina 2001b].

The media text interprets internal policy, external political, custom and other social circumstances. Probably that's why the ideological content of the media text is written representing one's interests. So if representation of natural existence text effects social regulation, the media text plays a significant role in creating the universe shape in many people's consciousness.

Now, let's consider the issues of presenting and discovering the meaning of the media text. It is reasonable to say that the socio morphic characteristic of the universe media shape is obvious because it is basically concentrated on the community and all social changes that take place in that community. It is natural that it might be a specific structure of the commonwealth as one type of multitude. The socio morphic characteristics of the universe media shape are demonstrated by the connection of its structure with social models.

The composition that orders the community individuals' social life interrelations properly creates particular social space. There are socio morphic parallels which are typical of information or media space created as the result of mass media activities. Those individuals that directly participate in community events create the social existence due to his actions. The introduction of the individual onto the social existence demonstrates the anthropomorphic description of the universe media shape. So there are two parameters typical of the universe media shape. It is reasonable to call them as socio morphic and anthropomorphic. Also, it is worthy to consider these two phenomena as the creator of universe shape composition that constructed opposite to each other. These two main factors form the universe media shape as the result of their interactions.

The demonstration of private and public interaction as one of the principal peculiarity of the community should be mentioned otherwise individuals create unity by gathering). The existence of individuals in the community, acting due to individuality are responsible for the composition of the universe shape in the individual's consciousness in two controversial directions, from socio and anthropomorphic media shape due to their interrelation as a result of individuals' interrelation [Rogozina 2001b].

CONCLUSION

Individual's consciousness is one of the systems to represent the existence. Here the universe shape is kept in the conceptual system. The presence of the conceptual system in individuals' consciousness assists to understand the differences of other subjects of the universe. So the conceptual system is responsible for the adaptation of the individual to the society as well as for the existence of the universe in individuals consciousness (individual shape of the universe).

The person addresses his individual shape of the universe to another person while creating the media text. In this process, he enriches and diversifies his universe shape by transforming it into another form. Due to it one part of his individual shape of the universe disappears turning onto other's property.

The main target of the universe shape is not the individual, but changing process of the object and subject world that surrounds it. Here, media text is the specific approach to make existence for the individual universe shape. For instance in the newspaper article there is a typical to the newspaper style (immanent) peculiarity. They are:

- a) physical objects (paper);
- b) peculiarities that provide social functions (media text belongs to one specific publishing house or a presence of graphical instruments to send its main idea)

Second, the media text models the individual's inner intentions in accordance with peculiarities of external surrounding world by renewing the form of the authors' universe shape. The author's inner intentions are strongly marked in comparison with emotive parts (integral parts) of the media text. Thus, there are also renovated adaptable peculiarities of the media text except the typical to the media text quality. Graphic structure of the media text might negatively effect to its contextual composition.

The universe media shape concentrates on the most important events of the globe being the complicated system of representing the obvious existence. The universe media shape collects and analyses the most important events and occurrences for the individual as well as for the society. It also gathers all integral parts of media text and plays a concluding role. The universe media shape through the media text connects the individual with the society. So it also plays the contracting role. The changing process of the media existence to psychological existence contributes the consolidation of the individual with the society. On this point, we can make a decision that there is a complete unity of the media existence with the individual existence. To sum up all above mentioned we are convinced to give the following decision about the term "media text":

1. Media text becomes an important element for accomplishing an information and communication process through the mass media;
2. Media text is undoubtedly an initial form of action used to carry out other types of interrelationships;
3. Media text is a complete and integrated unit of communication;
4. Media text is a complicated and compound model of representation of any part of natural existence;
5. Media text is the most potential means for interpreting circumstances, existence and processes;
6. Media text is the result of mechanical operation of the text in registering;
7. Media text is an accomplishment of pragmatic strategies to create an impression;
8. Media text is a powerful instrument used for social regulations;
9. Media text is a reconstructing factor for the universe media shape.

Therefore, it is reasonable to confirm that the media text is considered to be a unique powerful instrument of the mass media to create the media shape of the natural existence. In conclusion, we believe that this work will be a continuation of works on the model category of media linguistics.

REFERENCES

- Ahatova B.S. Language consciousness. PhD dissertation
- Aldasheva A. (1999). Contemporary press language- genre and stylistic peculiarities// State language: terminology, business correspondence and mass media language. Astana (pp.364-370).
- Dobrosklonckaya T.G. (2000). Theory and methods of media linguistics (based on english resourses). PhD dissertation. Moscow (p 350).
- Kolshansky G.V. (1978). Text as a unit of communication, Problems of general and germanic linguistics. Moscow (pp. 26-37).
- Leontyev A.N (1977). Activity, consciousness, personality. Moscow
- Luriya A.R. (1975). Basic poblems of neurolinguistics. Moscow, LSU publishing house (p.251).
- Lyubimova A.A. (2005). Language manupulation in mass media as a method for destroying the language picture of the world and traditional systems of values// Contemporary issues of public speech practice. Moscow (pp.25-45).
- Peeschalnikova V.A. (1991). Psycho poetry. Barnaul, Altay University publishing house (p.176).
- Rogozina I.V. (2001a). Social anthropomorphous nature of media picture of the world // Conseptual picture of the world and interpreting field of a text from the position of linguistic, jornalism and communicativistics: collected reports of All-union scientific and practical conference/ 25-26 June, 2001. Barnaul (pp.3-12).

- Rogozina I.V. (2001b). Media text as means of social regulation // Conceptual picture of the world and interpreting field of a text from the position of linguistic, journalism and communicativistics: collected reports of All-union scientific and practical conference/25-26 June 2001. Barnaul (pp.171-182).
- Russian Kazakh dictionary. (2005). Almaty: Dike-press (p. 423).
- Rozhdestvesky. (1997). Theory of rhetoric. Moscow (p.229).
- Sabato L. and Simpson G. (1996). Dirty little secrets: The persistence of corruption in American politics. – New York: Random House (p.320).
- Sheyigal Ye.I. (2000). Semiotics of political discourse. Monograph. Moscow-Volgograd: Peremena (p.363).
- Shmelev D.N. (1977). Russian in its functional variety. Moscow (p.104).
- Short dictionary on sociology. (1988). Moscow: Politizdat (p.478).
- Syzdykova R. (1986). Contemporary fiction prose language and its literary norms (confirmity and remoteness). Eloquence is the first step of the talent. Collected proverbs. – Almaty: Zhazushy
- Webster's New Encyclopedic Dictionary. (1993). Black Dog & Leventhal Publishing. New York, p.1787
- Yakobson R. (1975). Linguistic and poetics // Structuralism: "pros and cons". –Moscow: Progress. (pp.193-230).
- Zhumagulova M. (2005). Social political euphemisms in newspaper language. Almaty:Arys (p.118).

MAVIS: Special Education Virtual Assistant

Eliza D. MAPANOO

University of Perpetual Help System – Laguna

mapanoo.eliza@uphsl.edu.ph

0917-50253-12

Jonathan M. CABALLERO

Professor

Technological Institute of the Philippines

ABSTRACT

My Virtual Assistant Information System (MAVIS) served as a virtual assistant in special education. It includes basic lesson such as alphabet, numbers, animals, reading and a dictionary that enables teachers and student in a special education class sustains learning. Games and Videos are additional features of the system which caters supplementary tool in learning and bridges the gap between the traditional and modern learning. The system is created for the innovative learning schemes for Special Education Services which aim to have an innovative learning facility that could easily sustain the attention of a child and make learning fun and easy. The system (1) act as a Teacher Assistant in giving lessons mandated by teachers, (2) help teachers in providing educations, (3) catch students curiosity in learning. Based on the evaluation results the system evaluated rated 4.58 with a descriptive meaning of Excellent.

Keywords: Virtual Assistant, Learning, Education, Educational Services, Special Education, Virtual Assistant, LMS for Special Education

INTRODUCTION

Virtual assistant can save hours and energy in terms of doing assistance such as monitoring sales, doing mathematical calculations or even doing much more technical works. Lots of virtual assistance is floating in the market; every field has its own assistance that could help consumers to make work easier. For example, a travel agency might have travel research assistance that could assists costumer in booking a flight, plan itineraries and even look for a place to stay [1].

With the aid of technology, Cuthbertson (2015) in his article compare the capabilities of AI (Artificial Intelligence) virtual assistant to human cognitive capabilities. The report shows different AI technologies has been developed with the aid of Turing Machine's algorithms. Software developers embraces and merges the capabilities of artificial intelligence in providing and developing a good assistant. Among with their examples shown are (1) the 4-year-old child IQ test assistant, (2) Google DeepMind AI which wins over pac-man, (3) IBM Watson CTO, a purchase order assistant and (4) Siri [2].

With the advancement of technology in the academe and the willingness of the researchers to prove that virtual assistance could be an aid in better learning MAVIS (My Assistant Virtual Information System) arises. The system aims to assists educators in providing quality education among special and regular child enrolled in every academic institution.

My Assistant Virtual Information System (M.A.V.I.S) served as a supplementary tool in teaching kids ages from three (3) to seven (7) years old. It includes basic lessons such as alphabet, numbers, animals, and reading. It also contains mini dictionary and games. AGAPE Special Education Services provided list of lessons that should be included to M.A.V.I.S.

MAVIS is created for innovative learning schemes of every educational institution offering early childhood development for both regular and special children. Its main aim is to have an innovative facility that could catch child attention, be motivated in learning and make learning more fun and easy. MAVIS can also (1) act as a teacher assistant, giving lessons mandated by teacher, (2) help teachers to have repository of multimedia resources used within the class and (3) catch students curiosity in learning.

My Assistant Virtual Information System (M.A.V.I.S) is a Virtual Assistant of teacher which is loaded by the pre-defined lessons and topics (English, Math and Science). It is voice activated which follows every instruction supplied by the end – user. It has a mini dictionary which is composed of selected words approved by the schools, lessons in math, science, English which came from the school administrator. It is loaded with games suggested by the teachers and a video of different movies school usually used for their film showing. M.A.V.I.S as per requested by the evaluator will have the facility to add videos and lessons.

Benefits and Impacts

The system was developed to aid (1) Teachers to have a repository of their multimedia lessons, catch student's attention and track down student progress via apps assessment tool and (2) Students, will have innovative way of learning English, Science, Math and Values and experience an Artificial Assistant which will explain lessons via speech recognition. For fun learning, MAVIS is fully equipped by games, reading materials, videos, and dictionary of words.

REVIEW OF RELATED LITERATURE AND STUDIES

The Role of Virtual Assistance, its Essence and Importance

Intelligent Tutoring System have been developed to cope up problems in conventional classroom instruction and increase the academic capabilities of a student. In order to cope with previous problems, the study has developed a testing and diagnostic system based on tutoring behavior identified by VanLehn (2006). The proposed system, Model-tracing Intelligent Tutor (MIT), includes four components: (1) lexical analyzer (scanner); (2) syntax analyzer (parser); (3) semantic analyzer; and (4) report generator. MIT is implemented with the aim of conducting a one-to-one tutoring mechanism with instant feedback to improve learning in mathematics of students. Therefore, the research question is “what are the learning achievements of students after using MIT.” Finally, an experiment on a fraction lesson in a mathematics course was conducted to demonstrate the effectiveness of the proposed system [3].

The growth of online learning enrollment in higher education far exceeded the growth of traditional or face-to-face learning enrollment overall in recent years. However, several studies also showed that online students tended to have lower completion rates than their on-campus peer. The lack of interactions and timely support are considered primary reasons for the high dropout rate in online learning, especially in the asynchronous learning environment [4].

Major companies such as Google, Apple, Microsoft, Facebook and Amazon keeps on insisting on creating virtual assistant that are generalist, rather than specialists. These leading companies believes that consumers nowadays wanted to navigate machines through voice recognition. Artificial Intelligence developer's such as Amazon's Alexa, Barbie and Thomas' Talk Platform, Apple's Siri has become major de facto references in creating virtual assistant [5]. Even in the field of medicine around Michigan shows an interest of having a virtual assistant that could aid physician in giving lectures and training to Physician Assistant and rehabilitation students [6].

Ljubojevic [7] pointed out that the best way to teach in a millennial class is by means of multimedia teaching. Integrating multimedia lecture presentations increases student's perception in learning and enhancing the experience of teacher in delivering lessons. Assessment included in the multimedia teaching boosts the students excellency within the subject matter.

In addition to that, Jowati [8] says that LMS or Learning Management System is an additional parameter in determining student progress within the class. A good multimedia application can aid a child in delivering lessons and learning new topic can be done advance. However, an LMS should contain a token that will trigger every time the students will take quiz and should notify teacher with its progress.

With the recent advancement technology, its function, its capabilities and adaptation to any field of endeavors plays a lot to help environment grow. McCarthy [9] tested the efficiency and usability of artificial intelligence tutor for teaching and practicing braille. The group found out that when multimedia and technology are added to teaching, even special cases students can learn fast and with accuracy. Modern technology should be added to curriculum in order to meet the fast changing demand in technology and academe.

Hwang [10] believes that when a traditional and modern teaching are mixed together, with an additional requirements mandated by the curriculum blended forms a good tool in teaching and learning. The research proves that the best examples of teaching physiology reaction can be done using a video, created and evaluated by the key persons, is a good design of multimedia technology learning.

In the research done by Dwaik[11], blended learning in English Literature Courses with the aid of MOODLE (Modular Object Oriented /dynamic Learning Environment) and Technology could be a platform of disseminating multimedia literature across America. Literature will not die as long as Technology lives. Platform might be changing but the process, whether it is old when it is blended to new platform with the correct procedures injected onto it could present a new way of learning. American Literature topics added to Moodle, added to CALL (Computer Assisted Language Learning) forms BLA (blending learning approach), a new way of American Literature electronic – learning.

In 2012, Bull[12] uses twitter in High School Social Studies Class. After six weeks of teaching Tweeter and how it works, students are asked to tweet their sentiments, opinions, reflections, communications and pictures surrounding the intentions of founding father on the bill of rights. The research proved once again that the use of Technology connects students and boost one knowledge and creativity in learning.

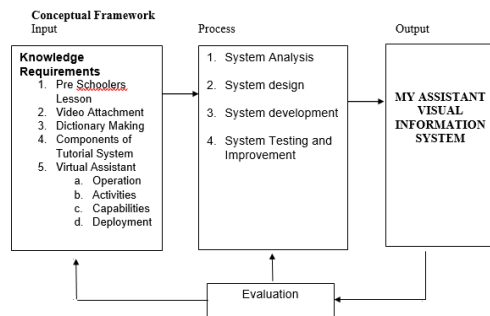


Figure 1.0: The Conceptual framework

Figure 1 illustrates the knowledge requirements gain by the developer in order to developed M.A.V.I.S in accordance to the business rules, policy and specifications mandated by the stakeholders. The proponent's skills in software project development, software designing, database development and multimedia development are all incorporated within the development of software. Periodically the software was tested for improvement. M.A.V.I.S. used ISO 9126 to make sure that the requirements given by the stakeholders are fully satisfied.

METHODOLOGY

Proposed Design Framework

My Assistant Virtual Information System follows the Agile Method (Figure 2.0) in developing the project. It involves stakeholders from designing, and to a continuous development of project.

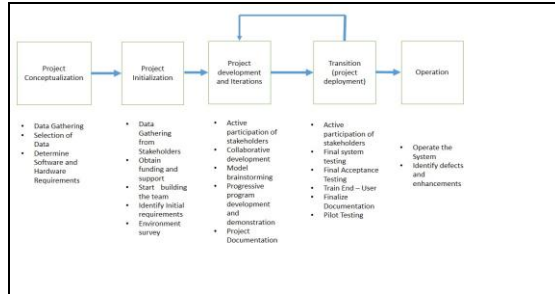


Figure 2.0: MAVIS Agile Method

In **project Conceptualization**, the developer gather all the necessary data needed for the development of project. Data are carefully selected and evaluated to determine what are the software and hardware requirements needed by the stakeholders and if the given rules and policy are injected to the conceptualization process.

During **Project Initiation** the developer presented the idea to stakeholder for critiquing and requirements identification. Stakeholders provide initial funding for the project and allow observation with the facility to experience the daily transaction within the environment. The developer also identifies each member tasks, duties and responsibilities to be done during and after project development.

Project development and iterations, in this phase the developer make sure that the stakeholders are included in the progressive development of the project. The team as an agreement to the stakeholders create a timeframe (Table 1) which serves as the timeline of both parties. A checklist is created by the developers to identifies which among modules and sections are in the critical path area and which one is behind on the given schedule. Quality Assurance Test are also done periodically to ensure that all tasks given to the developers are all done. Initial progress of the software was sent to the stakeholders to identify lacking requirements. Active participation for both stakeholders and developers in project development are mandated in **Transition (Project Development)** Phase, to ensure M.A.V.I.S. accuracy and reliability. End – users are also train in this phase gradually, this enable them to experience the software development which will provide them an ease in using and manipulating it. Alpha and Beta Testing are also done in this phase, several operational testing are done to ensure understandability on usage of program and determine the accuracy for every lessons included within the software.

Project Respondents

In this project, the developer intended to gather primary data from AGAPE Special Education Services.

Table 2. Respondents of the Study

Respondents	Population	Number of Sample Respondents
Teachers	5	5
Student and Parents	18	18
Total	23	23

Sampling Method

Stratified sampling method will be used to determine the number of respondents. The project respondents are divided into three (3) subgroups: Teachers, Special Children, and Regular Student.

Data Collection Method

The developer makes use of interview, actual observation and questionnaire to determine the need of having the project. It was chosen the primary source of data.

Respondents are identified and approached by the developer to conduct interview. Actual class observation was also done to fully understand the operations in AGAPE Special Education Services in providing both special and regular class.

Questionnaire was given to parents, teachers, principal and school owner to determine their needs and requirements in creating MAVIS. The result of the questionnaire shows that most of the parents and teachers wanted to have virtual assistant for their lessons.

Testing and Operating Procedure

As per requested by the stockholders, there will be three (3) set of testing prior to the beta and alpha testing of the project and another two (2) testing to finalize the project

Table 2: Testing and Operating Procedure Schedule

	Task	Start and End Dates
	Program Demonstration / Pilot Testing	October 13 - 16, 2016
	Second Program Testing	November 15, 2016
	Unit and Module Testing	December 12 – 23, 2016
	Beta testing and data gathering	January 09 – January 12, 2017
	Final Project Development based on beta testing results	January 16 – 21, 2017
	Final Testing	January 23 – 28, 2017

Table 2 shows the testing schedule as given by the stakeholders. For **Preliminary Testing**, unit testing was done for every unit or module included in M.A.V.I.S., . Program Demonstration or Pilot Testing shows the preliminary screens and how program works. For every unit or module incorporated in the system, testing is done, this will ensure smooth operation and all lessons are already added in the system. **Final Testing** was done to guarantee that all suggestions and recommendation stated during preliminary and unit testing are all included in the final development of project.

EVALUATION PROCEDURE

The Evaluation procedure is composed of three (3) stages:

1. **Unit evaluation** – the unit testing is conducted periodically by the developer team. Each lessons, unit or module which was included in the system was given one (1) week testing to determine its reliability in providing assistance and to check the accuracy of the data or information included in the system.
2. **Preliminary Evaluation** – all recommendations and suggestions done in the unit testing are included in the system which form the beta test of M.A.V.I.S... The developer seeks help from technical people such as teacher, curriculum developer and special program coordinator to evaluate the accuracy of all objects, exams and lessons included in the system.
3. **Final Evaluation** - survey instrument was distributed to the pilot area. To ensure its effectiveness, accuracy, understandability and reliability as a supplementary tool in providing knowledge among pre – schooler's it is also both tested in private and public day care centers.

Statistical Tool

The study used the statistical mean to interpret the results of the survey. Table 3 and 4 show the numerical rating and descriptive rating of the mean to interpret the results of the project evaluation.

Table 3: Numerical Rating

Numerical Scale	Interpretation
5	Excellent
4	Very Good
3	Good
2	Fair
1	Poor

Table 3 shows the numerical rating used in the questionnaire in order to determine the usefulness of the system. It is rated with five (5) having an excellent rating and one (1) as its lowest rating.

Table 4: Likert Scale

Numerical Scale	Descriptive Meaning
4.51 – 5.00	Excellent
3.51 – 4.50	Very Good
2.51 – 3.50	Good
1.51 – 2.50	Fair
1.00 – 1.50	Poor

The evaluated results were interpreted based on the mean that scores that gathered from the twenty-three (23) evaluators corresponding to parent, students, coordinators and teachers.

RESULTS AND DISCUSSIONS

This chapter presents the result as well as the discussion gathered from the final evaluation.

PROJECT EVALUATION

The evaluation was conducted through the use of survey instrument. Refer to Appendix A

Table 5. Summary of Software Evaluation Overall Mean Scores

INDICATORS	OVERALL MEAN	DESCRIPTIVE MEANING
A. FUNCTIONALITY	4.67	Excellent
B. CONTENT	4.64	Excellent
C. RELIABILITY	4.36	Very Good
D. AVAILABILITY	4.59	Excellent
E. MAINTAINABILITY	4.59	Excellent
F. SALEABILITY	4.65	Excellent
OVERALL MEAN	4.58	Excellent

The overall mean score is 4.58 which is equivalent to excellent. **Functionality** got the highest mean score which is 4.67. This attests that the system is easy to use, to operate and offers convenience and comfort in the end – user. **Saleability** follows next, with a mean score of 4.65, this shows that the system has a good design and catch the student's attention most. On the third place is **Content** with a mean score of 4.64, the presentation and accuracy of content is based on the present lessons given to the students. **Availability and Maintainability and Availability** falls into fourth place having a mean of 4.59, evaluator are looking forward for the completeness of program and a provision of how the system can be maintained without the aid of the developer. **Reliability** falls into last place having an overall mean of 4.36.

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of findings, conclusions and recommendations of the study.

Summary of Findings

M.A.V.I.S (My Assistance Virtual Information System) is a supplementary tool in learning and teaching pre-schoolers age 3 – 5 years old. It is divided into three (3) modules, (1) the lessons, where all specified lectures and topics stated by the stakeholders are all included, (2) the videos, the collections of videos which are presently and often used by the teachers in the pilot area are all included and (3) the games is a familiarization and an activity for the students to practice their thinking skills.

Based on the results of evaluation conducted, the following are the summary of the findings of the study:

- (1) **Functionality.** It is rated excellent because it provides ease of operation, comfort and convenience and it is easy to use.
- (2) **Content.** It was rated excellent because of the accuracy, updateness, and good presentation of content.
- (3) **Reliability.** It was rated very good because it conforms to the desired result, provides security and it is complete based on the given requirements by the stakeholders.
- (4) **Availability.** It was rated excellent because it performs according to specifications.
- (5) **Maintainability.** It was rated excellent because it is easy to maintain.
- (6) **Saleability.** The system was rated excellent because it is uncommon to have a virtual assistance as a supplementary tool in learning and teaching.

Conclusions

In consideration of the objectives of the study and the results of the evaluation, the following conclusion were drawn:

1. That the system meets the need of having a supplementary tool in learning and teaching a pre – schoolers by means of having a virtual assistance. Lessons, Modules, and Games mandated by the stakeholders are all included in the system. Requirements and Specifications are all checked and tested by the end – users and graded 4.58 which result to an Excellent descriptive meaning.
2. That the system based on the evaluation made in the pilot area and to another institutional agency which also caters the same curriculum has passed the capacity of catching student’s attentions and interest in learning.
3. That the system was tested and improved based on the suggestions and recommendations made by the stakeholders.

Recommendations

The following are recommended for further enhancement of the developed system

1. Aside from text file which serves as a database file since the pilot area does not have the capacity to buy yet a license software, M.A.V.I.S should have its own 4GL repository.
2. Improve the administrator sides in adding lessons, videos and quizzes or games.

REFERENCES

- Bull, Prince Hycy, Adams, Shayla (2012). “Learning technologies: Tweeting in a High School Social Studies Class”. *Journal of Educational Technology*, v8 n4 p26-33 Jan-Mar 2012. 8 pp
- Dizik, Alina P. “10 things to Outsource to a Virtual Assistant”. Retrieved from <https://www.entrepreneur.com/article/225318>
- Cuthbertson, Anthony (2015). *Amelia virtual assistant brings AI close to near human cognitive capabilities*. Retrieved from <http://www.ibtimes.co.uk/amelia-virtual-assistant-brings-ai-close-near-human-cognitive-capabilities-1522930>
- Dwaik, Raghad; Jweiless, Abdulmuti; Shrouf, Salah (2016). “Using Blended Learning to Enhance Student Learning in American Literature Courses” , *Turkish Online Journal of Educational Technology - TOJET*, v15 n2 p126-137 Apr 2016. 12 pp.
- Elgan, Mike (2016). *Why your Digital Virtual Assistants will need a Virtual Manager*. Eweek. 1/31/2016. P1-1. 1p.
- Hwang, Isabel, Tam, Michael, Lam, Shung Leung, Lam, Paul (2012). “Review of use of Animation as a Supplementary Learning material of Physiology Content in Four Academic Years”. *Electronic Journal of e Learning*, v10 n4 p368-377 2012
- Michael Shoemaker, Christina Platko, Susan M. Cleghorn, Andrew Brooth (2014). *Virtual Patient Care: an interprofessional education approach for physician assistant, physical therapy, and occupational therapy students*. *Journal of Interprofessional Care*. Jul2014, Vol. 28 Issue 4, p365-367, 3p.
- McCarthy, Tessa, Rosenblum, L. Penny, Johnson, Benny G., Dittel, Jeffrey, Kearns, Devin M. (20146). “An artificial Intelligence tutor: A supplementary tool for teaching and practicing braille”. *Journal of Visual Impairment & Blindness*, September – October 2016. Pages 309 – 322.
- Ljubojevic, Milos; Vaskovic, Vojkan; Stankovic, Srecko; Vaskovic, Jelena (2014). “Using supplementary video in multimedia instruction as a teaching tool to increase efficiency of Learning and Quality Experience.” *International Review of Research in Open and Distance Learning*, v15 n3 p275-291 Jul 2014
- Juhary, Jowati (2014). “Perceived Usefulness and ease of use of the Learning Management System as a Learning tool”. *International Education Studies*, v7 n8 p23-34 2014
- Phu Vu, Scott Fredrickson, Richard Meyer (2016). “ Help at 3:00 AM! Providing 24/7 Timely Support to Online Students via a Virtual Assistant”. Retrieved from

An Exploratory Study: Undergraduates' Perceptions Towards E-Learning Platforms in English Language Teaching (ELT) in Ecuador.

Paolo FABRE-MERCHÁN

*Universidad Estatal de Milagro; Kansas State University; Universidad Laica Eloy Alfaro de Manabí; Universidad Estatal de Guayaquil, Escuela Politecnica del Litoral
Ecuador. United States
pfabrem@unemi.edu.ec*

Bradley BURENHEIDE

*Universidad Estatal de Milagro; Kansas State University; Universidad Laica Eloy Alfaro de Manabí; Universidad Estatal de Guayaquil, Escuela Politecnica del Litoral
Ecuador. United States
brurenheide@ksu.edu*

Eder INTRIAGO-PALACIOS

*Universidad Estatal de Milagro; Kansas State University; Universidad Laica Eloy Alfaro de Manabí; Universidad Estatal de Guayaquil, Escuela Politecnica del Litoral
Ecuador. United States
eintriagop@uleam.edu.ec*

M. Antonieta MORALES-JARAMILLO

*Universidad Estatal de Milagro; Kansas State University; Universidad Laica Eloy Alfaro de Manabí; Universidad Estatal de Guayaquil, Escuela Politecnica del Litoral
Ecuador. United States
mantonietam@ug.edu.ec*

M. Veronica MORALES-JARAMILLO

*Universidad Estatal de Milagro; Kansas State University; Universidad Laica Eloy Alfaro de Manabí; Universidad Estatal de Guayaquil, Escuela Politecnica del Litoral
Ecuador; United States
vero_morales@yahoo.com*

ABSTRACT

Information and Communication Technology (ICT) has transformed today's society, having an increasingly essential role in many different areas. In the scope of English Language Teaching (ELT), as technology continues to become more attractive and pervasive, Learning Management Systems (LMS), Learning Content Management Systems (LCMS) and Content Management Systems (CMS) have become more and more popular for managing and delivering content. These otherwise known as learning platforms have spurred engaging discussion in terms of the extent to which they are beneficial for learning, and what their limitations are. Thus, this study aimed to analyze the Ecuadorian ICT context and what is being done to convince the learner of the 21st century to become proficient in English via these platforms.

To do so, a qualitative research design was applied through a General Scanning Model; an exploratory study was applied in four universities in Ecuador to determine undergraduates' perception towards e-learning platforms, considering variables like students' biographies, digital competences, and access to technology. On-line questionnaires, focus-groups and individual interviews were carried-out to collect and analyze the data. This study allowed us to better understand how the shifts brought about by technology have produced a new view of what constitutes learning a foreign language.

Key words: Information and Communication Technology, English Language Teaching, e-learning platform, Learning Management System, Learning Content Management System.

INTRODUCTION

This article looks at the variety of learning systems available for use in English Language Teaching and some platforms, which have been introduced in Ecuador in recent years. The systems discussed include Learning Management Systems, Learning Content Management Systems, and Content Management Systems. As they have become more and more used in schools in Ecuador, the question becomes how beneficial they are to learning and what their limitations are from students' perceptions. As we explore the realm of digital systems to aid in the ELT in Ecuador, it becomes necessary to address specific aspects of the Learning Management Systems (LMS), Learning Content Management Systems (LCMS), and Content Management Systems (CMS). Moreover, it is also essential to discuss: what the above systems are; considerations of implementation; and barriers to implementation in ELT settings.

What are the various kinds of systems?

As this study was prepared, it was important to address the three different types of systems available for use to aid the instructor in providing content. As noted in the introduction to this section, the three systems are Learning Management Systems (LMS), Learning Content Management Systems (LCMS), and Content Management Systems (CMS). Below are found definitions as to the differences between them.

A Learning Management System (LMS) is a robust Web-based software system that allows instructors “to build, structure, and deliver e-courses using educational resources of a variety of media on appropriate platforms” (Donnelly, Benson, & Kirk, 2012).

A Learning Content Management System (LCMS) is rooted in Web 2.0 technology that allows for a cost effective means of allowing an instructor to efficiently utilize learning objects throughout the process of “content development, management, and publishing” for teachers (Kim & Moon, 2012). An effective LCMS allows the instructor to create learning objects and to disseminate these objects to students

A Content Management System (CMS) also utilizes Web 2.0 technology for “content creation, maintenance, versioning, and publishing on portals and search engines” (Kim & Moon, 2012). These systems are used to store learning objects and support their consistent availability for an instructor. In a sense, a CMS is but a warehouse for an instructor to push out learning objects for use in classrooms.

While these three systems seem to be similar, there are degrees of separation as to their effectiveness and their ability to aid in the development of learning. An LMS provides multiple tools to aid in the instruction of a class in an independent manner. An LMS can allow a student to learn independently with minimal intrusion of the instructor. This tool allows a class to run with minimal maintenance on the behalf of the teacher. These web-based systems have evolved to include tools such as discussion boards, server based grading, structuring of learning groups, and other Web 2.0 applications. An LCMS allows for instructors to create and disseminate materials within the learning system, but the other robust pieces found in an LMS are not found as easily. Likewise, a CMS is even less robust, which only allows an instructor to receive objects shared by the instructor that are created outside of the application, much like a cloud memory system.

Considerations of Implementation

In the implementation of Management Systems in the classroom, it is important to keep in mind that these learning environments are dependent upon the desires of the instructor. The more robust the system, the instructor has greater possibilities in their classroom. If to use a LMS instead of a CMS, the instructor has the potential to promote greater interaction amongst their students thanks to the Web 2.0 capabilities of the LMS. As they analyze the potential of the LMS, there are multiple concerns to the choice of Management System. There are extrinsic and intrinsic factors to consider, among which, tenure is a concern (Aziah & Marzuki, 2005). But to use technology as a content repository, those that choose systems must consider the methodologies of the teacher. If this is not done, training becomes necessary to fully take advantage of the benefits of the system (Conole, 2004). With a robust enough system, collaboration and cooperation become possible and should be encouraged to take full advantage of the potentialities (Weaver, Spratt, & Sid, 2008).

As discovered in this research, in considering what system is most appropriate for specific learning situations, the process involves planning, implementation, evaluation, revision, and updating. These considerations revolve around the teachers' habits of planning, implementing, assessing, and learning. As discovered, the selection of Management Systems takes into account not only what is cost effective, but also what is beneficial for students (Mullinix & McCurry, 2003; Fabre, Boroto & Soto, 2016) and in particular what is good for assessment of that learning (Laster 2005; Smith 1996). But what is of greater concern is the engagement of students in their learning (Laster, 2005). In this sense, we need to pursue the creation of an engaging learning environment, which is essential to increase students' motivation and commitment to work, producing a positive effect on participation and productivity (Fabre & Boroto, 2017).

As for the benefits of using a management system in an ELT program, there are definite benefits. To explore the benefits, recent research shows that the most current systems allow for collaboration in writing (Yim & Warschauer, 2017), asynchronous peer review processes (Saeed & Ghazali, 2017), autonomous learning (Lee, 2016), and of great benefit to ELT learners deeper identity development (Fong, Lin, & Engle, 2016) which enhances Biographical Driven Instruction, a proven model for ELT instruction and Culturally and Linguistically Diverse students (Herrera, Holmes, & Kavimandan, 2012).

Challenges to Implementation

There are two distinct concerns to the implementation of a Management System, the quality of the system and the concerns of accessibility and regulations in the Ecuadorian system.

The first is the issue of quality of the system. When we look at the system, the most obvious concern is that of quality. The technology must be effective and it must enhance the process of teaching and learning (Weaver, Spratt & Sid, C, 2008). However, the quality of a system is not a guarantee of effective learning. There must be training to improve quality (Covington, Petherbridge & Warren, 2005). This becomes evident when we find that 70% of academic staff experience limitations when applying technology due to poor training (Weaver, Spratt & Sid, C, 2008). Most Ecuadorian universities are still during implementation phases; they train teachers, socialize the systems with the students, implement the LMS but they do not apply a continue assessment to evaluate the quality

Additionally, within the Ecuadorian ICT context, accessibility is one of the major issues when effectively applying LMS. The policies and regulations that frame Ecuadorian universities' promote and demand the use of technological resources and virtual platforms to ensure quality in their educational systems. However, they are just starting in this innovative area and there is so much to improve, especially in terms of accessibility. Some universities have costly, fancy resources, but they do not wisely use them because of poor Internet access or infrastructure.

Since the changes to the Ecuadorian Constitution in 2008, several laws were passed and consequent reforms took place. One such reform occurred in education on all levels. Particular to this study are the changes in Higher Education. Among the most important implementation was the establishing of an accreditation process that among some of the most drastic effects ended in the closing down of fourteen universities (CEACES, 2013). The demands of this process of accreditation stipulates among other things that universities in Ecuador must have an integrated electronic system that articulates all the activities pertaining to student-teacher life. This virtual system would need to allow students to enrol and engage in classes, among other things.

The four universities within their system have an LMS whose level of advancement and integration is at varying degrees based on factors such as financial resources allotted, level of training on the part of the staff in charge, and supplier of the software. However, little by little, these centres have been learning from the mistakes and feedback from instructors and students. For example, at one of the universities, during the first year of implementation, there was a lot of opposition on the part of the teaching staff because for example the LMS allowed opportunities to upload homework and learning resources via embedded material or links, but did not allow to grade homework. This however was fixed the following semester and reluctant teachers embraced the idea more optimistically. So, the process is still on and the comments and suggestions from teachers and students are key in the process.

As for how these LMSs have been used to promote foreign language learning, it must be mentioned that this has also been handled based on each university's structure, internal regulations, resources and staff. In all cases however, these universities have the responsibility of guaranteeing English language learning at the B2 proficiency level of the Common European Framework of Reference for Languages (CES, 2017). And because of this, the centers for English language learning as well as undergraduate and graduate degree programs of these universities have taken actions for English language teachers to manage their classes via the LMS in their general platforms.

THE STUDY

A qualitative research study was conducted through an exploratory design, which was applied in four Ecuadorian universities located in different cities to determine undergraduates' perceptions towards e-learning platforms. The data was gathered using online questionnaires, focus-group and individual interviews which were previously designed and validated by the participants and other external experts. The focus-group and individual interviews were applied in different sessions to better validate the data collected, which gave us the opportunity to reflect and to re-transcribe the information, obtaining more visible and trustable results. The data analysis was carried-out through a General Scanning Model, which allowed us to interpret and to find that features like students' age, previous academic exposure, and access to technology strongly affect their perceptions toward learning English through technology. This study was focused on students' biographies, access to technology, digital abilities, and their attitudes and willingness to work with technology, which were discussed together with the questionnaires and interviews during the data collection stage.

RESULTS&DISCUSSION

The questionnaires provided us with relevant information to build participants' profiles, which were essential variables to determine students' perceptions, finding strong variations among their attitudes towards learning English through technology features depending on their age see [Figure 1], gender see [Figure 2], level of English proficiency see [Figure 3], and the development of digital skills see [Figure 4], which are the most relevant aspects of participants' profiles.

Figure 1: Percentage of the sample's profiles grouped according to their age. Data obtained from the on-line questionnaires applied to participants.

Figure 2: Percentage of the sample's profiles grouped according to their gender. Data obtained from the on-line questionnaires applied to participants.

Figure 3: Percentage of the sample's profiles grouped according to their English proficiency level. Data obtained from the on-line questionnaires applied to participants and academic records.

Figure 4: Percentage of the sample's profiles grouped according to their academic background in terms of digital ability exposure and training. Data obtained from the on-line questionnaires and interviews applied to participants.

After analyzing students' profiles and the data collected through the interviews and questionnaires, the outcomes of the research demonstrated that students' perceptions and willingness to work with technology is mainly influenced by their age, which is a main factor that teachers need to take into account when designing and applying a technological curriculum design. The data analyzed revealed that younger students are more willing to work with technology because they were born in the technological era, which means that their digital abilities are more developed, having few issues when manipulating new software and not needing much teachers' help or explanation to operate technology. Most of them mentioned repeatedly, "Technology is fun and easy for learning." However, younger students have limited access to it. A high percentage of them only have access to technology within the university facilities or in places like Internet-cafes because they do not have an income that allows them to acquire mobile technology or Internet access at all times. Thus, this drives us, as teachers, to consider not sending too much homework that require the use of technology outside the university campus when we are teaching a class with a high population of teenagers or young adults, say between 15 to 24 years of age. Likewise, this analysis also guided us to bear in mind that it is possible to explore and to introduce novel technological innovations within this group of students since it is easy for them to learn how to manage new tech resources in a shorter and faster time. Thus, they demonstrate positive attitudes and an active participation in any activity that involves working with virtual means. On the other hand, adult students have a better access to technology, but their motivation and commitment to work with technology is low. One of the aspects that repeatedly appeared as a main cause of this issue was the poor training on digital abilities, which made it harder for them to manipulate the different technological tools. Most of them mentioned, "I really prefer to do it using traditional means, paper and pen." This analysis made us to consider that it is essential to provide students alternatives and support them to develop their digital skills before exposing them to technological resources when working with adults. Some of the students mentioned that they would appreciate if their teachers took the time to sit down and to individually explain to them how to use technology, step by step. They mentioned that they strongly agree that technology is highly necessary and that it has many features, websites, apps, etc. that can be beneficial for them; nevertheless, it is difficult for them to manage technology without scaffolding. The relationship among the themes and variables in terms of students' profile are better displayed on [Figure 5].

Figure 5: Relation among variables and participants' age. Data gathered from online-questionnaires, individual and focus-group interviews applied to participants.

Beside the variations found in the different age and gender groups of students, all of them agree that e-learning platforms are very useful and necessary when learning a foreign language, especially in a country where the exposure to the language in everyday tasks is almost null. Therefore, the research demonstrated that students have positive perceptions towards learning English through virtual means. However, participants also mentioned that technology is not being used wisely; they consider that the educational programs must be better planned and they, as students, need to receive strong support when they have poor training in digital abilities.

The data analysis also brought-out a relevant aspect in terms of how technology is being used currently. Most of the students mentioned that they are currently using only basic features of technology such as sending assignments, checking progress and grades, and uploading and downloading formats and information; technology is seen as a content repository, see [Graph 1]. Thus, is technology only a content repository? Is this way that teachers and curriculum designers want learners to use technology? This situation guided us to reflect and to consider that students' perceptions towards e-learning have also been strongly affected by how technology is being used; students lose motivation and commitment to work with technological features when they notice that technology is not supporting them to achieve the goals their programs offered them, i.e. their expectations at the beginning of the course are normally high, but they are negatively affected along the development of the course program.

Graph 1: The common features of technology that are currently been used

In this sense, the study demonstrated that;

- a.) Students' perceptions towards ELT through e-learning platforms varied depending on different variables,
- b.) Students believe that technology is helpful and that it provides them great features to learn English,
- c.) Some of them claimed not receiving the correct scaffolding to use technology wisely,
- d.) Age is a relevant aspect of students' profile to take in mind when designing and applying technological curriculum designs, and
- e.) Poor scaffolding may negatively affected adults' motivation and commitment to work with technology.

CONCLUSION

It is undeniable that technology has impregnated the classrooms of second language teaching. More and more our students need to have access to learning activities and environments that allow them the so necessary contact with the language being learned. LMS in that sense have become a promising alternative that many Higher Education establishments have decided to adopt to articulate a space to organize content, facilitate student-teacher and student-student interaction, and promote effective lasting learning. However, universities need to look into how learners are reacting to these new environments; without doing so, we run the risk of having a costly, fancy but sub-exploited resources.

This paper is a first step towards fully taking advantage of LMSs. New research is necessary to determine how effective LMSs in these four universities are. Also, it would be interesting to know what learning activities, resources, or phases in the teaching-learning process are yielding better results. In both cases, the opportunity for conducting research in this new arena is there and it is up to language learning advocates of these institutions to take action

REFERENCES

- Aziah, N. & Marzuki, A. (2005). Innovation for better teaching and learning: Adopting the learning management system [On-line]. *Malaysian Online Journal of Instructional Technology*, 2 (2), 27 - 40. Available: <http://www.myjurnal.my/public/browse-journal-view.php?id=208>
- CEAACES, (2013). "*Suspendida por falta de calidad*". *El cierre de catorce universidades en Ecuador*. Quito, Ecuador: Consejo de Evaluación, Acreditación y Aseguramiento de la Calidad de la Educación Superior, 2013.
- Conole, G. (2004). E-learning: The hype and the reality. *Journal of Interactive Media in Education*, 2004(12). Retrieved from: <http://www-jime.open.ac.uk/2004/12/>
- CES. (2017). *Reglamento de Carrera y Escalafón del Profesor e Investigador del Sistema de Educacion Superior*. Retrieved from Consejo de Educación Superior website: <http://www.ces.gob.ec/>
- Covington, D., Petherbridge, D., & Warren, S. E. (2005). Best practices: A triangulated support approach in transitioning faculty to online teaching [On-line]. *Online Journal of Distance Learning Administration*, 8(1), 3-14. Available: <https://www.westga.edu/~distance/ojdl/>
- Donnelly, P., Benson, J., & Kirk, P. (2012). *How to succeed at e-learning*. Available: <http://ebookcentral.proquest.com>
- Fabre, P., Boroto, J., & Soto, S. (2016). *Approaches to EFL teaching: Curriculum, Instruction, Assessment & Technology*. Editorial de la Universidad Técnica de Machala: Machala, Ecuador.
- Fabre, P. & Boroto, J. (2017). A motivated student is a productive learner [Conference paper]. *INTED 2017*, 7772-7780. Available: <https://library.iated.org/view/FABREMERCHAN2017AMO>
- Fong, C. J., Lin, S., & Engle, R. A. (2016). Positioning identity in computer mediated discourse among ESOL learners [On-line]. *Language Learning & Technology*, 20(3), pp. 142-158.
- Herrera, S. G., Holmes, M. A., & Kavimandan, S. K. (2012) Bringing theory to life: Strategies that make culturally responsive pedagogy a reality in diverse secondary classrooms. *International Journal of Multicultural Education*, 14(3),

- Kim, K. R., & Moon, N. M. (2012). Designing a social learning content management system based on learning objects. *Multimedia Tools and Applications*, 64(2), pp. 423-437.
- Laster, S. (2005). Model-driven design: Systematically building integrated blended learning experiences [On-line]. *Journal of Asynchronous Learning Networks*, 8(5), 23-40. Available: http://sloanconsortium.org/publications/olj_main
- Lee, L. (2016). Autonomous learning through task-based instruction in fully online language courses. *Language Learning & Technology*, 20(2), pp. 81-97.
- Mullinix, B. B., & McCurry, D. (2003). Balancing the learning equation: Exploring effective mixtures of technology, teaching, and learning [On-line}. Available: http://technologysource.org/article/balancing_the_learning_equation/
- Saeed, M. A., & Ghazali, K. (2017) Asynchronous group review of EFL writing: Interactions and text revisions. *Language Learning & Technology* 21(2), pp. 200-206.
- Smith, K. L. (1996). Preparing faculty for instructional technology: From education to development to creative independence. *Paper presented at 1996 CAUSE Annual Conference*. Retrieved June 11, 2006, from <http://www.educause.edu/ir/library/pdf/CNC9659.pdf>
- Weaver, D., Spratt, C. & Sid, C. (2008). Academic and student use of a learning management system: Implications for quality. *Australasian Journal of Educational Technology*, 24 (1), 30 - 41. Available: <https://ajet.org.au/index.php/AJET>
- Yim, S., & Warschauer, M. (2017). Web-based collaborative writing in L2 contexts: Methodological insights from text mining. *Language Learning & Technology*, 21(1), pp. 146-165.

Mobile Devices Change the Way of Taught, Learned and Practiced

Bih Ni LEE

*Universiti Malaysia Sabah,
Faculty of Psychology and Education,
Malaysia
leeh_ni@yahoo.com*

ABSTRACT

This article discusses the mobile technology is changing the way of teaching, learning and practice. Researchers have used a narrative review of literature to describe the current state of both art and science in the focus of research. Smartphones and tablets have become the new cultural norm in personal and professional life. Mainly tablets are used to improve teaching, learning and practice of medicine. Researchers have used a literary narrative research to build the foundation of scientific knowledge. Researchers have collected all the important points in the discussion, and put them in here with reference to the specific areas in which this paper was originally based. The results showed that some European medical schools recognize the value of tablet computers and learning in loans or give as a gift to the students. Six of the eight members accounted for consideration, which reflects the many uses we all realized in universities, libraries, hospitals, anywhere. Every new technology offers the potential to transform the educational environment and disrupt the status quo in the classroom. On the one hand, technology has been observed to promote student-centered learning, which theorists and policy support for the development of preschool education in didactic teaching style again. Technology to promote student learning through collaboration and challenges, verification task various disciplines by providing a real environment complex for student questions, provide information and tools to assist in the investigation, and connect classes for joint research and development based on the vision to build a scenario for learning space Futurelab.

Keywords: Mobile Devices, Web Tools, Mobile Technology

INTRODUCTION

As students use the tablets to learn and seek information, it is clear that this will affect the future of libraries too. What can store medical libraries in the age of mobile devices as a new cultural norm? Some reactions or actions to support tablet loans, backup applications, content licensing, or train students to make the best of this device. Some medical libraries have developed their own applications (Bjergfelt, 2016) or write iBooks (Toro-Troconis, 2016), some - with the help of faculty participate - You apply tablet machine and content into the curriculum. Projects in this issue presents a series of interventions on the use of mobile devices and technology in schools and school libraries. Devices classified as devices like the iPad to students (Gehrlein, Obst, Teemu, 2016) or a mini iPad for clinical students (Toro-Troconis, 2016), or as a loan (from 1 day to 1.5 years) or gifts; Content is available as iBooks or eBook, which has been developed specifically (Toro-Troconis, 2016) or licensing of the project (Bissels, Bruch, Obst), or what it is (eg through paper allows schools); applications available to encourage student participation before, during and after college. Often this is a pdf reader like a good reader, such as system cm limbic, anatomy body as seen Campus Book Electronic Publishers Thieme exclusively as, or to the point of care applications such as BMJ best practices and UpToDate (Fuller & Joynes, 2015).

In addition, the application has been developed by the faculty and library (Bruch, Jergfelt, 2015). Presented a brief overview of a collection of papers: Richard Fuller and Viktoria Joynes Medical Institute of Education Leeds, UK, tells us how the sources of mobile learning to shape the way students study hard healthcare. Sabine Gehrlein Library of the University of Heidelberg, Germany, this loan program for their iPad to enhance mobile technology and health education.

Maria Toro-Troconis and colleagues from Imperial College London, UK, told us about their big projects on the implementation of mobile learning strategies for graduate medical education. Oliver Obst, branch Library of Medicine, University of Munster, Germany, discussed in his article "A tablet toolbox to implement learning resources mobile digital curriculum on" the future role of libraries, especially in the business model in the future important accounts printing textbooks, Gerhard Bissels, Fachbereichsbibliothek Buhlplatz, University of Bern, Switzerland, presented the findings at the e-book that was rebuilt: how e-book tablet to improve decision. Teemu copy, Faculty of Medicine, University of Helsinki, Finland, writes about the project at the Medical Faculty of the University of Helsinki iPad.

2011 projects Meilahti Campus Library started lending Terkko of the iPad equipped with textbooks, and from 2013, the iPad has been given to each student who entered. Sarah Bruch and Hospital Tony Paget, Library, Prince Philip, Llanelli, and College of Medicine, University of Swansea, Wales, United Kingdom, notified us an application with them for six books written doc health including the BNF (British National Formulary) and the Oxford Handbook of Medicine clinical and meaningful as "just-intime" source for new doctors. Mikael Bjergfelt, University Library Karolinska Institutet, Stockholm, Sweden, praised the design to satisfy mobile KIB their application ".

Although many studies have shown convincingly here, there are other projects in Europe to combat the use of mobile technology in medical settings, which can not be covered: the launch of the iPad in 2010, University of Orthodontics Clinic Münster, Germany, is a dental school's first United States to introduce the iPad in clinical courses. The department is a loan from the iPad and iPad mini to all students of dental education. Jochen Bretschneider Mobile Learning Initiative, VU University Medical Center, Amsterdam, Netherlands, teaching medical students with the help of interactive iBooks. Mark Hamilton of the School of Medicine, University of Leicester, UK, started in 2013 to give all students the first year of the iPad to start the "digital textbooks" and replace the printed book. Guus van den Brekel, Central Library of Medicine, Faculty of Health Sciences, Groningen, Netherlands, is a loan from the iPad, scientists recorded and used regularly and learn how to use it. The Careum Medizinbibliothek, Hauptbibliothek, University of Zurich, Switzerland, is a loan from the iPad.

METHOD

Researchers collect all the important points of discussion, and synthesis them here with reference to the specific field where this paper is originally based on.

TEACHER PRACTICES WITH MOBILE TECHNOLOGY

Historically, technology has been seen as a potential solution to improve educational attainment. In 1913, Thomas Edison suggested that the film will replace books in schools in the last ten years, and the current forecast Edison failed to materialize, sentiment he remained in the minds of educators and policymakers alike. From television and computers to laptops and tablet devices now, every new technology brings the potential to revolutionize the education system (Wartella & Jennings, 2000). Since 1996, the federal government has spent more than ten billion dollars in computer technology for education (O'Dwyer, Russell, Bebell, & Tucker-Seeley, 2005), and US Department of Education (2010) issued by the National Education Technology Plan to promote learning student-centered technology as a way to improve academic achievement. this interest in technology to support student-centered learning practices, and refuse to policy makers, stakeholders, and the economist for the American people to become proficient in literacy and media technology, is contrary to the current American educational environment.

Built on the factory model of education of the 19th century, where the intention is to educate the public, the current system is outdated and focuses on skills and training practices (Peterson, 2011). While policy and development theorists have provided evidence that the practice of student-centered, as opposed to traditional didactic model, can promote student learning and engagement (eg, Dewey, 1902; Katz, 1988; Bredekamp & Copple, 1997; Vygotsky, 1978), the education system has become resistant to change and are not universally adopted this way of teaching and learning.

In fact, schools often remain resistant to the integration of technology as technology tends to disrupt traditional classroom practice (Collins & Halverson, 2009). A study of 12 K- 35 525 teachers by Project Tomorrow (2011) showed that the most frequent use of technology is for homework and practices (58%), indicating educators do not exploit the potential of technology to a unique destination but try to fit it into their curriculum has been set for use with a didactic way. Research also shows that teachers play an important role in whether and how much of the technology used in the classroom (Ertmer, 1999; Penuel, 2006), and since many teachers have been trained in traditional teaching pedagogy, this is always in the face of technology integration in in class (Parette, Quesenberry and Blum, 2009; Sheingold, 1991). In addition, the technology itself has unique features that affect the use, sometimes making practice in the classroom easier but at other times that create more problems than it's worth using the technology.

This affordances and constraints to technology integration further highlighted in early childhood education, where King talks about the appropriateness of using technology to children. Although the National Association for the Education of Young Children (NAEYC, 2012) encourages the use of appropriate technology in early education, other organizations, such as the American Academy of Pediatrics (2001; 2011; 2013), wary of screen time for young chil- children. Drawing on Orlikowski (1992) duality theory of technology, the current study investigates environment of early childhood education that is unique to better understand how the characteristics of an institutional, personal, and technology affect how teachers integrate computers into a tablet.

TECHNOLOGY IN EDUCATION

Every new technology provides potential for both transforming the educational environment and disrupt the status quo in the classroom (Wartella & Jennings, 2000). On the one hand, technology has been observed to promote student-centered learning, which theorists and policy support for the development of early childhood education on a more didactic teaching style (Burns, Griffin, & Snow, 1999). As Means and Olsen (1997) explains, the technology "to promote student learning through joint ventures in, challenging, multidisciplinary task authentic by providing realistic complex environment for student questions, provide information and tools to support the investigation, [and] connecting classrooms for joint investigation "(p. 9). In addition, the practice of student-centered learning activities focusing on motivation and interest related to the life of the child (Vygotsky, 1978; Wood, Bruner, & Ross, 1976). Therefore, the technology in general, and more particularly tablets, can change classroom practice and has implications for teaching and learning. On the other hand, there is often resistance by schools and teachers to integrate technology in order to maintain the current teaching practice (Collins & Halverson, 2009; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). Although access to technology improvements, the study still reported underuse of technology in the classroom, especially in the field of early childhood education (Blackwell, Lauricella, Wartella, Robb, and Schomburg, 2013). In general, the results can not be concluded whether technological advances educational attainment (eg, Cheung & Slavin, 2013), and no technology to date has been ubiquitously altered the landscape of education to transform teaching and learning practices in a large scale. As Buckingham (2007) said earlier promises of technology revolution in education has failed to produce much change.

While the debate about whether technology can or will change American education sector, support to integrate technology into the classroom has come from policy makers, economists, and theorists development, including NAEYC (2012), whose position new- this new statement supporting the use of the development of appropriate technology in early childhood education. Indeed, in all countries schools integrate mobile technology later at an increasing rate. In 2013, Apple reported 4.5 million iPads in American educational institutions, three times the number reported just a year ago in 2012 (Paczkowski, 2013). Furthermore, in the 2013-2014 school year, Los Angeles, CA, the second largest school system in the country more than 31,000 iPads was launched to serve all K-12 students in this area at a great price of \$ 30 million (Svensson, 2013). While these numbers are staggering, little is known about the effects of tablet computers to teaching and learning.

TABLET COMPUTERS

Excitement over iPads is partly due to the anecdotal evidence of mobile technology shows promising effect on the learning outcomes. mobile technology is very motivating and more attractive than the traditional classroom (Henderson & Yeow, 2012). tablet computers, in particular, can be used anywhere / anytime and foster an individualized learning, as teachers can use the device as a tool for students learning scaffold (Lemke, Coughlin, & Reifsneider, 2009). In addition, the tablet offers a unique home-school by providing students with classroom experience related to the real world of technology saturation, and tablets can reduce the digital divide by providing low-income and minority students with exposure to the device (Lemke et al., 2009). touch screen enables direct manipulation and intuitive to learn because there is no mouse (Buxton, Hill, & Rowley, 1985), making them easier than cognitive computer (Geist, 2012). Thus, teachers can choose to use tablets more often than they previously chose to use a desktop or laptop computer. In addition, from the cost standpoint, the tablet is much cheaper than laptops. Finally, the tablet provides users with access to a wide range of software due to the high number of applications that are available, with more than 500,000 apps in the Apple iTunes store and iTunes 72% of educational apps targeting preschool and primary children (Shuler, 2012).

Although little evidence exists on how the tablet computer is integrated into the classroom and how this integration change or emphasize the current teaching practices, features that provide unique evidence that the tablet computer can enact any changes in the educational environment.

DUALITY OF TECHNOLOGY IN EDUCATION

Given the unique affordances tablet, resistance to technology school, and teachers barriers to technology integration, the current study uses Orlikowski (1992) duality technology model as a framework to explain how the tablet is integrated into early childhood education and the effect of the device is in the attitude and teacher practice. prior research on computers in early childhood education have used this approach to help explain the integration of computers (Lindahl & Folkesson, 2012).

Using the theory (1984) Structuration Giddens' with the use of technology in the organization, Orlikowski (1992) proposed to explain the duality of technology dynamic relationship between technology, agents, and institutions. In Giddens (1984) theory, the agent provide the rules, resources, and social norms that are presented by larger institutions of society, and in doing so, reproduce and also has the power to re-appropriate institutional structure through individual action. Orlikowski (1992) expanded this model to a three-part system, where institutional structures are still affecting agentive action, but the technology is an additional factor that has built-in capabilities that can be used or re-allocated by the agent-in novel ways.

According Orlikowski (1992), it is the dynamic relationship between the agent and the technology of the larger institutional structures can be changed. Apply (1992) Orlikowski model for the integration of technology in education can be achieved at different levels of analysis, but for the purposes of this study, the school will be the institutional structure, teacher agents, and tablet computer technology. On a large scale, the change (or lack thereof) in teacher practices and attitudes are influenced by the integration of technology into the classroom will eventually affect the institution, whether to strengthen or modify a preexisting structure, such as the model of traditional didactic education.

GOING MOBILE IN THE CLASSROOM

It's a question that many educators face today. The Common Core State Standards call for students to develop digital media and technology skills. One way to help them achieve that goal: combine the tools they are familiar with - mobile phones, tablets, and smartphones - into their learning environment. "Great potential with mobile is that it really is the main portal for social communications," said Mimi Ito, a cultural anthropologist at the departments of anthropology and informatics at the University of California Irvine and the John D. and Catherine T. MacArthur Chair Foundation Digital Media and Learning. "Young children learn best when they relate to them, when there is social connections bound him, and when they actually have a personal interest." National Association of Secondary School Principals has been trying to understand the social storm and Mobile Technologies. They have just released a position statement, a summary of opinion on the matter, it was surprisingly good. They actively encourage schools to receive smart phones, and social networks as part of their education provision, and offer various guidelines and advice to the different levels of practitioners. In a report, they deal head on the challenges of the rapid growth in the use of social media and mobile devices has created both a crisis and an opportunity for school leaders. Unfortunately, many realizing the first principal of social technology in an unpleasant situation, such as a conflict arising from a change in the social media. And school leaders are often unstable and cyberbullying and sexting incident in which guidance is often inadequate and contradictory. It's no wonder that school leaders responded by trying to eliminate the use of mobile and social media in school. Mobile and social technologies become ubiquitous, trying to block their increasingly ineffective. For example, in schools that ban cell phones, 54% of students still reported texting during the school day (Lenhart, 2010). And it is a rare student who can not do end runs around the filter Internet with a simple proxy server. More importantly, as mobile devices become more powerful and less expensive, their potential to improve student learning has come into clearer focus. Social networking sites provide a platform for students' creativity by enabling them to design projects using words, music, pictures and video. In recent years, including the explosive growth in student create, manipulate, and share content online (National School Board Association, 2007). Recognizing the value of education to encourage such behavior, many school leaders have shifted their energy from limiting the use of this technology to limit their abuse. They suggested some sound principles, that any enlightened teacher will share education must prepare students to become active, constructive participant in a global society. Technology-enhanced instruction has the capacity to engage students deeply in their work, connecting them with resources that are countless, and allows them to collaborate across time and space. Schools must provide student-centered experience, personal, and tailored to all students-a basic tenet of the Breaking Ranks framework for school improvement. Schools should support and value the important model in a civil and democratic society. Learning can happen only when the students felt free from violence and harassment. Schools need to offer a more effective role in decision-making to the students to promote student learning and the participation, responsibility and ownership. And then offer specific suggestions for different leaders in education.

KNOW YOUR CELL PHONE MOBILE DEVICES

The easiest of them all but still quite strong. They can be used for group discussions via text message, and because so many cell phones have cameras, they are useful for project-based photography as well. Students can also record themselves reading the story stronger for the workshop authors' or practicing a speech.

E-BOOK READERS

Their basic function is, of course, is to read the books and save the entire library. They also provide easy access to the dictionary. Many students also use their e-book reader as a replacement for the paper every day, because they can read a variety of editions and magazines on it known brands including Amazon Kindle and the Barnes & Noble Nook. An e-reader is similar in form to a tablet computer. A tablet typically has a LCD screen capable of refresh rates higher which makes it more suitable for interaction. tablet computer is also more versatile, allowing a person to eat a wide variety of content and also created it. The main advantages of electronic paper e-readers better reading of their screen, especially in sunlight, and longer battery life (Falcon, 2010). Commercial electronic paper sold mostly available in black and white (16 shades of gray). Sony Librie, issued in 2004 and founder of the Sony Reader, the first e-readers using electronic paper (Sonny, 2004).

Ectaco jetBook Color is the first color e-reader on the market, but criticized muted colors (Andrew, 2013). Many e-readers can use the Internet via Wi-Fi and built-in software sometimes provides links to libraries OPDS digital or e-book retailer, which allows users to buy, borrow, and receive digital e-book. In this way, the books owned by the user who is managed in the cloud, and e-readers may download material from any location. An e-reader can also download e-books from your computer or read them from a memory card.

MP3 AND PORTABLE MEDIA PLAYER (SUCH AS IPOD TOUCH)

Free lectures and short videos are available for download through iTunes U, or on the Internet at sites such as Brainpop.com, which has animated educational videos. Apps can also be downloaded to the device and many students are equipped with the camera can be used to shoot and to submit to the website. Read blog Edutopia "iPod, listen, read" (bit.ly/dzzqll) to learn more about how these tools are used to help students master reading. MPEG-1 or MPEG-2 Audio Layer III, more commonly referred to as MP3, is an audio format for encoding digital audio using a form of lossy data compression. It is a common audio format for consumer audio live or storage, as well as the de facto standard of digital audio compression for the transfer and playback of music on digital audio players most. Use lossy compression is designed to reduce the amount of data required to represent the audio recording and still sound like a faithful reproduction of the original uncompressed audio to most listeners. MP3 files are created using the setting of 128 kbit / s will result in a file that is about 1/11 the size of CD-quality files. MP3 files can also be built at a higher bit rate or lower, with the resulting higher quality or lower. Compression works by reducing accuracy of certain parts of sound that are considered to be outside the auditory resolution ability of most people. This method is commonly referred to as perceptual coding. It uses psychoacoustic models to discard or reduce precision of components less audible to human hearing, and then record the information in an efficient manner. MP3 is designed by the Moving Picture Experts Group (MPEG) as part of the standard MPEG-1 and subsequently extended in MPEG-2 standard. The first subset of the audio has been established by several teams of engineers at Fraunhofer IIS, the University of Hanover, AT & T-Bell Labs, Thomson-Brandt, CCETT, and others. MPEG-1 Audio (MPEG-1 Part 3), including MPEG-1 Layer Audio I, II and III was approved as a draft committee ISO / IEC standard in 1991, finalized in 1992 and published in 1993 (ISO / IEC 11172 -3: 1993). Backwards compatible MPEG-2 Audio (MPEG-2, Part 3) with the bit rate and sample rate supplement was published in 1995 (ISO / IEC 13818-3: 1995) (Finlayson, 2008).

iPod Touch (processed and marketed as iPod touch) is a PC-based handheld all-purpose iOS designed and marketed by Apple Inc. with a user interface based on touch screen. It can be used as a music and video players, digital cameras, handheld gaming devices and personal digital assistants (PDA). It connects to the Internet only via Wi-Fi base station, do not use the cellular network data, and thus is not a smartphone, although it has a similar design to the iPhone and is often referred to as the "iPhone without the phone". Furthermore, it does not fit within the Apple iPhone accessories like cases their skin. As of May 2013, 100 million iPod Touch units have been sold. It also is the most popular iPod model. iPod touch models sold by storage space and color, with all models of the same generation usually offer similar features if not, processors, and performance, in addition to the existing operating system upgrades; the exception is the fifth-generation, low-end (16 GB) model was initially sold without a rear facing camera. The current iPod touch is the sixth generation model, released in 2015 (Rubin, 2014).

TABLETS

Apple iPad, Kindle Fire and Galaxy tablet models only, and they can do any e-book reader can do and then some. the app is downloaded, many education, makes the machine almost on par with the computer; you can surf the web, play games, watch (and make) movies and take pictures. Many schools have started to buy tablets for public K-5, although they are useful for older students as well. A tablet computer, usually shortened to tablets, mobile computer with touch screen display, circuit and battery in a single device. The tablet is equipped with a sensor, such as a camera, microphone and accelerometer, and touchscreen display with your finger or stylus motion recognition signal replaces a mouse and keyboard.

They usually appear on the screen, pop-up virtual keyboard for typing. Tablets may have physical buttons for the basic features such as speaker volume and power, and ports for network communication and battery charging. Tablets are usually larger than a smart phone or personal digital assistant with a screen 7 inches (18 cm) or greater, measured diagonally. Tablets can be classified according to the presence and the physical appearance of the keyboard. Blackboard and booklets do not have a physical keyboard and usually have text input is done through the use of a virtual keyboard projected on the screen touch-enabled display. Hybrid, convertible and 2-in-1 does not have a physical keyboard (even if protected or hidden or can be separated), but they usually also use the virtual keyboard. Format inspired by the mid 20th century and prototyped and developed in the last two decades of the century. In April 2010, the iPad was released, which was the first mass-market tablet with multi-touch finger friendly and dedicated operating system. Tablets experienced a rapid rise in popularity and ubiquity and a large product categories (Apple, 2010).

SMART PHONE

The older the student, the more likely they will be holding the reins of one of the. Such as tablets, smart phones have many functions such as a computer. (They also phone, of course.) They can run applications and software, record audio and video, send and receive e-mail and text - functions can easily be channeled into question the classroom. Smartphones are not really smart in terms of possessing a great deal of intelligence. They just called smart connected to "feature phones," which is the name given to the basic mobile phone previous generation. Smartphones are considered more intelligent than feature phones because they can connect to the Internet; perform basic calculations so that one can play the game; save larger amounts of data such as contact lists and documents easily; and be able to use affordances such as geolocation, accelerometer, and sensors to perform a function that is not available on mobile. But they are not "smart" in the way that the next generation of smartphones will. Smart phone in the next five years will have a more powerful CPU and faster, which allows them to process large amounts of data by using highly sophisticated algorithms. And, they will learn as they interact with their owners in the world around them. They will have much more memory, and will be linked to a supercomputer like IBM Watson, which has been used for medical diagnosis doctor sent to tablet and mobile phone. This new technology is only possible because we have entered the era of "big data" with a giant leap in the amount of data available to organizations that they can use to analyze and predict the behavior of both staff and customers. As the CEO of Google, Eric Schmidt told attendees at the Conference in 2010 Techonomy, in Lake Tahoe, "the dawn of civilization through 2003, there were only 5 exabytes of information created. That information is now created in two days, and the rate is increasing. People the public is not ready for the technology revolution going to happen to them. "not only the amount of data growing exponentially, but a new kind of data becomes available. This includes data about the location, orientation, movement, activity level, spending patterns and data on how mobile devices are used. All of this data has led to new methods of data analysis for both retail and for learning. new mobile application development that uses a combination of big data and artificial intelligence to provide "smart tool" to all users (Gary, 2014).

TOOLS FOR MOBILE USERS

SCRATCHED

Educators can get support for computer-programming language developed by researchers at the Lifelong Kindergarten group at the MIT Media Lab. Scratch allows students of all ages to create games and animation, and the calculation of the master and math skills. Scratch is a free visual programming language (Marji, 2014). Scratch is used by students, scholars, teachers, and parents to easily create animations, games, etc. and provide a stepping stone to the more advanced world of computer programming. It can also be used for a range of educational and entertainment constructionist purposes from math and science projects, including simulations and visualizations of experiments, recording lectures with animated presentations, to social sciences animated stories, and interactive art and music (Choi, 2013). Viewing the existing projects available on the Scratch website, or modifying and testing any modification without saving it requires no online registration. Scratch allows users to use event-driven programming with multiple active objects called sprites (Marji, 2014).

Sprites can be drawn, as vector or bitmap graphics, from scratch in a simple editor that is part of Scratch, or can be imported from external sources, including webcams. As of 2013, Scratch 2 is available online and as an application for Windows, OS X, and Linux (Adobe Air Required) (Roque, 2013). The source code of Scratch 1.x is released under GPLv2 license and Scratch Source Code License (Hill, 2013).

GOOGLE APPS FOR EDUCATION

Google has a broad suite of applications that foster collaborative learning. Documents can be edited and shared group; The calendar can be adjusted so that the students all on the same page, schedule-wise; teachers and students can back up lesson plans, notes, and other materials. The free productivity tools simplify and save time with classroom, gmail, docs and more. Classroom creates assignments paperlessly and stay organized. Devices get laptops and tablets that are affordable and easy to manage. Google Apps for Education is free. They plan to keep the core offering of Google Apps for Education free. This offering includes user accounts for future incoming students. Google was founded by a research project at Stanford University, and this is just one way can give back to the educational community (Google, 2016).

GOOD IPAD APPS FOR HISTORY AND GEOGRAPHY TEACHERS

Here are some good iPad apps for History and Geography teachers. *World Atlas HD*: iPad users can download this stunning, popular digital atlas by the National Geographic Society and educate themselves about the planet's physical and cultural properties and relationships. *MyCongress*: Stay up-to-date with the latest news and views from the House of Representatives and the Senate with profiles of Congresspeople and information about current bills. *National Geographic Today*: Indulge in bite-sized, nourishing daily doses of geography videos, photos, and more through the globe-trotting juggernaut. *WORLD BOOK – This Day in History for iPad*: Like the title states, this app displays what historical events happened on what particular day; flipping through the calendar function and looking ahead is encouraged! *History: Maps of the World*: History and geography (duh) collide on this very popular resource, which provides access to maps past and present so users can watch how borders and projections shift over time. *Constitution and Federalist Papers*: Win (or lose, but we're trying to be nice here) any argument about American politics by keeping some of its core founding documents on hand as a reference. *Google Earth*: Explore the world in veritable real-time thanks to the detailed (and sometimes super creepy) Google Earth tool, now available on the iPad. *World History Atlas for iPad*: Maps.com provides an absolutely stunning visual resource about the most important, influential maps — and their corresponding events — of all time. *205 National Anthems, Maps, Flags, Facts*: Enjoy a crash course in the basic characteristics of 205 countries and use it as a springboard into deeper geographical inquiry. *Top 100 – People in History*: Read up on the biographies of some of the world's most influential names and kickstart lessons in some not-so-famous folks who still left a major impact. (Educators Technology, 2016)

SCENARIOS FOR FURTHER EDUCATION – DEVELOPED USING THE FUTURELAB BUILDING VISIONS FOR LEARNING SPACES SCENARIO CARDS

Working and Learning Together on Placement in Business Studies:

Understudies on situation for Business Studies are for the most part set an assortment of errands to be examined and did in their work environment. A case may be "depict the enlistment and maintenance process in an association". This system, in one school, depicted by the present understudies as "exhausting" and bringing about bunches of composed work, will be drastically amended however understudies' utilization of cell phones, dependably on network and interactive media. Cell phones (handhelds or smaller scale portable workstations) will empower understudies to contact far off companions and school coaches through sound, video, messaging and email. This could incorporate multi-way 'address time' video conferencing. Giving or guaranteeing understudies have gadgets with worldwide situating frameworks (GPS) would not just permit the instructor to know where the greater part of the understudies are found, additionally to tell the understudies where each other were. By sharing their work, understudies would know where the holes were in their insight/aptitudes and could recognize somebody, a companion or a mentor, to fill those necessities.

GPS would then empower them to discover who was topographically closest to the individual distinguished and direct him/her to their area. Understudies could likewise share their work while 'out in the field', so as to figure out how each other is handling the same issues. They would not need to hold up until they return to their showing base before collaborating. However, once back at the showing base, the understudies would have the capacity to store the advantages they have made amid their time on situation, for example, video, sound, content inputs and other examination notes for evaluation and/or offering to their or future accomplices of understudies. Results for this cooperative learning situation empowered through cell phones will incorporate meeting course evaluation necessities as well as the improvement of between individual aptitudes, for example, coordinated effort abilities, figuring out how to accommodate distinctive data from various sources and correspondence with individuals of various ages, social gatherings and expertise sets. This situation was thought by others in the system to be prone to become possibly the most important factor before 2015 as the innovation is as of now set up and can possibly make a typically "exhausting" point substantially more intriguing for the learners. However there are various obstructions that would should be surmounted first, for example, the preparation and duty required from the school IT bolster staff for supporting understudies put in various areas. There may likewise be interoperability issues relying upon whether the school has chosen to give one standard gadget or to depend on understudies' close to home gadgets. In conclusion one noteworthy inquiry emerges with this situation about the moral issues of i) utilizing GPS to "track" individuals, for example, the understudies in this situation ii) recording conceivably special data about the work environment's business systems. While understudies may not protest their companions knowing where they are through GPS, they may not need coaches to know their area. Whilst managers are cheerful to prepare Business Studies understudies inside their association they may not need mixed media records leaving the premises. For this situation to be acknowledged it seems clear that there should be assent ahead of time amongst manager and school about every single conceivable procedure required in understudies accumulation and sharing of information for assignments (Wishart, and Green, (2015).

Recording Experiential Learning in Leisure and Tourism:

A relaxation and tourism understudy moves between a few distinctive in vogue venues on a work situation day discharge plan. She has been requested that make a portfolio to connect applied thoughts from the course syllabus with her experiential learning in recreation and tourism. The genuine innovation utilized would all be on the web. This would mean that reasons, for example, 'I overlooked my tablet' will be out of date as everything would be situated in an online e-portfolio framework including VLE/blog/wiki style instruments i.e. with inbuilt, very much incorporated person to person communication instruments. This online e-portfolio framework can be redesigned by handheld camera telephones and Netbooks and additionally tablet and desktop PCs and expect fast versatile broadband is for all time accessible through wi-fi or the cell system. The framework would have both private and open spaces, so that as the understudy circumvents recording her work, she can keep that in a private space. She can then build up her records by means of a tablet or desktop with a bigger screen at school or at home and exchange the subsequent task to the general population space when completed, to be seen by her mentor, chief, guide and others as required. She would likewise have entry to online instructional exercises while out in the field, to give theoretical standards and pointers to her to connection them to her practice. Results for the understudy would include: an industry perceived capability from the Institution or College; new aptitudes pertinent to recreation and tourism and in overseeing new portable innovations to bolster learning. She could keep the e-portfolio as something to expand upon in what's to come. This situation was additionally seen by different respondents from the system as prone to be essentially before 2015. They considered that this style of appraisal is liable to engage work situation suppliers and that recreation and tourism would be a reasonable subject. Such understudies can without much of a stretch catch their encounters which can be less simple or even denied different subjects for instance, building situation understudies are not permitted to bring cell phones close generation lines as producers wish to hold their plans under wraps. Respondents differ about whether this situation would be practical weighing up the reserve funds of having all appraisal finished online against the potential wireless system costs.

Additionally who might finance the broadband utilization? Who might claim the innovation? There was additionally some worry over the suspicion that all understudies would have individual access to Smartphones or Netbooks, especially in this understudy populace where there are numerous from impeded foundations. Nor have e-portfolios been a staggering accomplishment to date inciting various functional, specialized and theoretical issues (Adamson, 2006). However the situation would most likely speak to understudies (until they found the amount of work it would be?) and, as everything is gotten to by means of a web program modified for the gadget it is running on, won't be debilitated by interoperability issues (Wishart, and Green, (2015).

CONCLUSION

Mobile devices and applications are changing the way people learn. Online teaching career has been set on a journey of discovery. It has been providing creative freedom, and an endless source of learning materials, and the possibility to teach students from all over the world. It is necessary to recognize the importance of technology in the classroom and e-learning as a platform to teach. More and more students are using mobile devices to connect to the web. Mobile learning (or m-learning) is the ability to learn anywhere and at any time using portable electronic devices. Mobile learning is less structured than e-learning and in my opinion that both complements perfectly. Our world today is obsessed with doing everything faster, learning included. Self-study is clearly important in learning. As little as one hour a week studying alone can greatly improve student progress. Most students choose to study online because of time restrictions. Due to the use of mobile technology is increasing, it offers the possibility for students to learn anytime, anyplace and at their own convenience via their mobile devices. Students begin with a little homework activities, realistic. Students spend a few minutes or hours at a stunning applications are available and encourage them to learn in a way that is portable.

REFERENCES

- Adamson, V. (2006) *Final report on the University of Nottingham's JISC e-Portfolio Reference Model Project Technology and Evaluation Seminar*. Inverness: Glenaffric Ltd.
- American Academy of Pediatrics (2011). *Babies and Toddlers Should Learn From Play, Not Screens*. Elk Grove, IL: Author. Retrieved from: <http://www.aap.org/pressroom/mediaunder2.pdf>.
- American Academy of Pediatrics (2013). *Children, Adolescents, and the Media*. Elk Grove, IL: Counsel on Communication and Media, American Academy of Pediatrics. Retrieved from: <http://m.pediatrics.aappublications.org/content/early/2013/10/24/peds.2013-2656.full.pdf>. Accessed 10 December 2013.
- American Academy of Pediatrics. (2001). Policy Statement: Children, Adolescents, and Television. *Pediatrics*, 107(2), 423-426. doi: 10.1542/peds.107.2.423.
- Andrew, W. (2013). *Ectaco jetBook Color E-ink reader*. UK:Time Inc. (UK) Ltd
- Apple. (2010). *iPad Available in US on April 3*. US: Apple
- Based Interactive Technology. *Journal of Instructional Psychology*, 39(1), 26-35.
- Blackwell, C.K., Lauricella, A., Wartella, E., Robb, M., & Schomburg, R. (2013). Adoption and Use of Technology in Early Education: The interplay of extrinsic barriers and teacher attitudes. *Computers and Education*, 310-319.
- Bredenkamp, S., & Copple, S. (Eds.). (1997). *Developmentally appropriate practice in early childhood programs (revised ed.)*. Washington, DC: National Association for the Education of Young Children.
- Bruch, S & Jergefelt, M. 2015. Use of mobile devices in medical libraries. Stockholm: Institutet University Library.
- Buckingham, D. (2007). *Beyond Technology: Children's Learning in the Age of Digital*
- Burns, M.S., Griffin, P., & Snow, C. (Eds.). (1999). *Starting out right: A guide to promoting children's reading success*. Washington, DC: National Academy Press.
- Buxton, W., Hill, R., & Rowley, P. (1985). Issues and Techniques in Touch-Sensitive Tablet Input. Proceedings from the SIGGRAPH'85: *The 12th annual conference on computer graphics and interactive technologies*. New York, NY: ACM.

- Cheung, A., & Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: A meta-analysis. *Educational Research Review*, 9, 88-113. doi:10.1016/j.edurev.2013.01.001.
- Choi, B., Jung, J. & Baek, Y. (2013). *In what way can technology enhance student learning? : A preliminary study of technology supported learning in mathematics*. In R. McBride & M. Searson (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2013* (pp. 3-9). Chesapeake, VA: AACE.
- Collins, A., & Halverson, R. (2009). *Rethinking Education in the Age of Technology: The Digital Revolution and Schooling in America*. New York, NY: Teachers College Pres.
- Collins, A., & Halverson, R. (2009). *Rethinking Education in the Age of Technology: The Digital Revolution and Schooling in America*. New York, NY: Teachers College Press.
- Courtney Blackwell. (2014). Teacher Practices With Mobile Technology Integrating Tablet Computers Into The Early Childhood Classroom. *Journal of Education Research ISSN: 1935-052X. Volume 7, Number 4*, 1-25.
- Culture. Cambridge, UK: Polity Press. Shuler, 2012.
- Dewey, J. (1902). *The Child and the Curriculum*. Chicago, IL: University of Chicago Press.
- Educators Technology. (2016). *Educational Technology and Mobile Learning :10 Useful History And Geography Apps*. California: EdTech Team.
- Ertmer, P.A. (1999). Addressing first and second order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 47-61.
- Eutopia. Mobile Devices For Learning. What You Need To Know. Retrieved Feb 27, 2016 from <http://www.edutopia.org/pdfs/guides/edutopia-mobile-learning-guide.pdf>
- Falcone, J. (2010). *Kindle vs. Nook vs. iPad: Which e-book reader should you buy?*. US: CNet.
- Finlayson, R. (2008). A More Loss-Tolerant RTP Payload Format for MP3 Audio. US: Live Networks
- Fuller, R. & Joynes, V. 2015. Enhancement Or Replacement? Understanding How Legitimised Use Of Mobile Learning Resources Is Shaping How Healthcare Students Are Learning. United Kingdom: School of Medicine, University of Leeds.
- Gary, W. (2014). *Smartphones Will Offer Personalized Learning and Decision Support*. Morton: Float.
- Gehrlein, S., Obst, O., & Teemu, M. 2016. *Ipads For Undergraduates*. Finland: Faculty of Medicine, University of Helsinki.
- Geist, E.A. (2012). A Qualitative Examination of Two-Year-Olds Interaction With Tablet
- Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structure*. Berkeley, CA: University of California Press.
- Google. (2016). *Google Apps for Education: Common Questions*. US: Stanford University.
- Henderson, S., & Yeow, J. (2012). iPad in Education: A case study of iPad adoption and use in primary school. *Proceedings from HICSS, 2012: The 45th Hawaii International Conference on System Sciences*. Manoa, HI. http://www.huffingtonpost.com/2013/06/20/lausd-students-ipad_n_3472714.html. Accessed 15 September 2013.
- Hill, B.M. & Monroy-Hernández, A. (2013). *The cost of collaboration for code and art: Evidence from a remixing community*. Forthcoming in *Proceedings of the ACM Conference on Computer Supported Cooperative Work (CSCW '13)*. San Antonio, Texas, USA: ACM.
- Jergefelt, M. (2016). *Librarian & Web Developer*. Sweden: Karolinska Institutet.
- Katz, L. (1988). Engaging Children's Minds: The Implications Of Research For Early Childhood Education. In C. Warger (Ed.), *A Resource Guide To Public School Early Childhood Programs* (pp. 32-52). Alexandria, VA: Association for Supervision and Curriculum Development.
- Lemke, C., Coughlin, E., & Reifsneider, D. (2009). Technology in Schools: what the research says: an update. Culver City, CA: commissioned by Cisco Systems. Retrieved from: <http://www.cisco.com/web/strategy/docs/education/TechnologyinSchoolsReport.pdf>
- Lenhart, A., Purcell, K., Smith, A., Zickuhr, K. (2010). *Social Media and Young Adults*. US: Pew Internet & American Life Research Center

- Lindahl, M.G., & Folkesson, A. (2012). Can we let computers change practice? Educators' interpretations of preschool tradition. *Computers in Human Behavior*, 28(5), 1728-1737. doi: 10.1016/j.chb.2012.04.012.
- Means, B., & Olson, K. (1997). *Technology and education reform: Studies of education reform*. Washington DC: U. S. Government Printing Office.
- Marji, Majed (2014). *Learn to Program with Scratch*. San Francisco. California: No Starch Press.
- National Association for the Education of Young Children. (2012). *Position Statement: Technology and Young Children*. Washington, DC: Author. Retrieved from: <http://www.naeyc.org/content/technology-and-young-children>. Accessed 20 November 2012.
- National School Boards Association . (2007). *National School Boards Association Releases New Report on Social Networking in Schools*. US: The Unquiet Librarian
- O'Dwyer, L. M., Russell, M., Bebell, D., & Tucker-Seeley, K. R. (2005). Examining the Relationship Between Home and School Computer Use and Students' English/ Language Arts Test Scores. *The Journal of Technology, Learning, and Assessment, Volume 3, Number 3 · January 2005*.
- Oliver Obst. (2015). Mobile devices change the way medicine is taught, learned and practiced. That's a great challenge for libraries. Retrieved Feb 27, 2016. <http://eahil.eu/wp-content/uploads/2015/05/obst-4-6.pdf>
- Orlikowski, W. J. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organization Science*, 3(3), 398-427.
- Paczkowski, J. (2013 February 28). Apple's iTunes U Hits One Billion Downloads. Retrieved from: <http://allthingsd.com/20130228/apples-itunes-u-hits-1-billion-downloads/>. Accessed 21 May 2013.
- Parette, H.P., Quesenberry, A.C., & Blum, C. (2009). Missing the Boat with Technology Usage in Early Childhood Settings: A 21st Century View of Developmentally Appropriate Practice. *Early Childhood Education Journal*, 37, 335-343. doi: 10.1007/s10643-009-0352-x
- Penuel, W. R. (2006). Implementation and effects of 1:1 computing initiatives: A research synthesis. *Journal of Research on Technology in Education*, 38(3), 329-348.
- Peterson, P. (2011). *Saving Schools: From Horace Mann to Virtual Learning*. Cambridge, MA: Harvard University Press.
- Roque, R., Rusk, N., & Blanton, A. (2013). *Youth roles and leadership in an online creative community*. In Computer Supported Collaborative Learning Conference Proceedings, Volume 1, International Society of the Learning Sciences.
- Rubin, B.F. (2014). *Apple cuts prices on iPod Touch line, refreshes 16GB model*. US: CNET
- Sheingold, K. (1991). Restructuring for learning with technology: The potential for synergy. *Phi Delta Kappan*, 73(1), 17-27.
- Sony, L. (2004). *The first ever E-ink e-book Reader*. US: Mobile mag.
- Svensson, P. (2013, June 19). *LAUSD Students To Get iPad, Expenditure Will Cost School District \$30 Million*. Huffington Post. Retrieved April 27, 2016 from: http://www.huffingtonpost.com/2013/06/20/lausd-students-ipad_n_3472714.html.
- Toro-Troconis, M. (2016). *Game-Based Learning, Virtual Patients and Blended Learning*. London: School of Medicine, Imperial College.
- Vygotsky, L. (1978). *Mind in Society*. Cambridge, MA: Harvard University Press.
- Wartella, E.A. & Jennings, N. 2000. Children And Computers: New Technology. Old Concerns. Concerns. *The Future of Children*, 10(2), 31-43.
- Wishart, J and Green, D. (2015) *Identifying Emerging Issues in Mobile Learning in Higher and Further Education: A report to JISC*. Bristol, Wasington: Graduate School of Education University of Bristol.

Not a Burden Any More: Completion Tasks as an Alternative Format of Test Practice in Complex Learning

Hyun JOO

*Dept. of Educational Technology
Hanyang University
South Korea
koreaspy21@gmail.com*

Chungsoo NA

*Dept. of Educational Technology
Hanyang University
South Korea
skcjdtm@gmail.com*

Jinju LEE

*Dept. of Educational Technology
Hanyang University
South Korea
jinju.a.lee@gmail.com*

Joeeun CHOI

*Dept. of Educational Technology
Hanyang University
South Korea
ChoiJoeeun90@gmail.com*

Dongsik KIM

*Dept. of Educational Technology
Hanyang University
South Korea
kimdsik@hanyang.ac.kr*

Jihoon SONG

*Dept. of Educational Technology
Hanyang University
South Korea
psu.jihoonsong@gmail.com*

ABSTRACT

The study aims to investigate the effects of test formats after worked examples on learning outcomes and cognitive load in complex learning. 74 middle school students were randomly assigned to three groups: restudy, completion task, and conventional problem-solving. The conventional problem-solving group performed significantly the highest transfer test and cognitive load among three groups. These findings revealed testing effect in complex learning and showed that the completion task as a test format can be an alternative testing format when considering both learning outcomes and cognitive load; thus, serving as a good stepping stone between the learning and evaluation phases.

INTRODUCTION

The testing effect refers the idea that, after an initial learning phase, taking a test is more effective for transfer than restudying the same material (Roediger & Karpicke, 2006). The benefits of testing have reemerged as a promising strategy to improve learning performance (Fiorella & Mayer, 2016). A recent meta-analysis of 118 studies were robust and showed relatively higher effect size of the testing effect ($g = 0.51$) (Adesope, Trevisan, & Sundararajan, 2017). Nevertheless, many testing effect studies have used relatively simple tasks such as comprehending prose passages (Zaromb & Roediger, 2010) and memorizing words lists (Karpicke & Roediger, 2008). However, given that real-world educational contexts tend to teach more complex tasks that demand higher levels of learners' cognitive processing abilities, more research effort should be put to validating the testing effect on complex tasks.

Van Gog & Kester (2012) have studied the testing effect with worked examples in complex task. Worked examples provide learners with solution steps that bridge the given state and the target problem (Renkl & Atkinson, 2010). Research has shown that for novices, studying worked examples is more effective for learning than conventional problem solving (i.e., worked example effect, Atkinson, Derry, Renkl, & Wortham, 2000). In research on the worked example effect, learners were presented with a worked example to study followed by a problem to solve (“example-problem pairs”). This approach was similar to presenting learners with some information then testing their learning (Leahy, Hanham, & Sweller, 2015).

Another learning strategy is known as restudying, which is where learners study material, engage in worked examples, and then study the material again. According to Van Gog et al. (2015), participants who engaged in restudying outperformed those who took tests after studying with worked example (i.e., example-problem pairs). In other words, there was no test effecting in complex learning with worked examples. However, Karpicke and Aue (2015) have indicated that previous studies (van Gog et al., 2015) did not give sufficient consideration to how complexity was defined and controlled in each learning task; thus, it is impossible to accurately gauge the presence of the testing effect when learning complex tasks based on available studies. Such contradicting results call for further investigation on whether the testing effect applies to complex task. Furthermore, the present study attempted on proving testing effect in complex task, but by implementing completion task as an additional test format in between the conventional problem solving and the worked examples.

A completion task is like a worked example but with part of solution steps removed so that the learners will fill in the missing knowledge themselves (van Merriënboer & Sweller, 2005), giving learners more opportunities to actively apply the acquired knowledge than they would when completing worked example. These opportunities encourage them to engage in important problem-solving processes. When dealing with complex tasks, its high element interactivity would demand great processing on working memory (Jung, Kim, & Na., 2016; Kalyuga, 2011). Cognitive load theory states that if this demand exceeds learners’ capacities, effective learning is hindered and learners become demotivated (Sweller, Ayres, & Kalyuga, 2011). Compared to example-completion pairs, example-problem pairs may overwhelm learners who are required to solve a problem right after studying the worked example (Renkl, Atkinson, Maier & Staley, 2002). Completion tasks serve as a bridge between when learners learn how to complete a task and when they actually complete the task on their own, reducing cognitive load (Renkl & Atkinson, 2010). Given that optimal learning strategies for complex tasks are not fully understood, current research has been investigating the testing effect on complex tasks and how completion tasks effect test performance and cognitive load. The present study seeks to add to this effort, so its three research questions were as follows:

- RQ1. What are the effects of test formats after studying with worked examples on complex task learning outcomes?
- RQ2. What are the effects of test formats after studying with worked examples on cognitive load?
- RQ3. Are there any differences between completion tasks and conventional problem solving in learning outcomes and cognitive load?

RESEARCH METHODOLOGY

Participants

Seventy-four students (average age = 14.00; female = 44.9%) from a middle school in Seoul, South Korea participated in this study. They were in their first year of middle school and were intentionally chosen for this reason because they would be likely to have the least amount of prior knowledge about the learning task, which is important because prior knowledge influences learning outcomes and cognitive load (Plass et al., 2010). To ensure homogeneity among three experimental groups with regard to prior knowledge, a one-way ANOVA test was conducted ($F(2, 71) = .380, p = .685$).

Experimental Materials

The experiment taught participants social studies materials after which students were asked to determine of market equilibrium price as authentic tasks. To solve this problem, the students had to consider the law of supply and demand and how market supply and demand are represented graphically. This task was a complex problem because the students had to process several elements and how they interacted. The research team and social studies teachers with between three and five years of teaching experience developed the experimental materials. A pilot test was conducted in order to determine the experimental materials’ difficulty level and how long the experiment was likely to take. Learning materials were created for each step in the lesson step, see [Table 1] and [Figure 1].

Table 1: Learning objectives of each learning steps

Learning Objectives	Learning Step		
	Step 1	Step 2	Step 3
	The law demand, supply and demand-supply curve	The principle of demand and supply curve shift	The principle of market equilibrium price and equilibrium trade

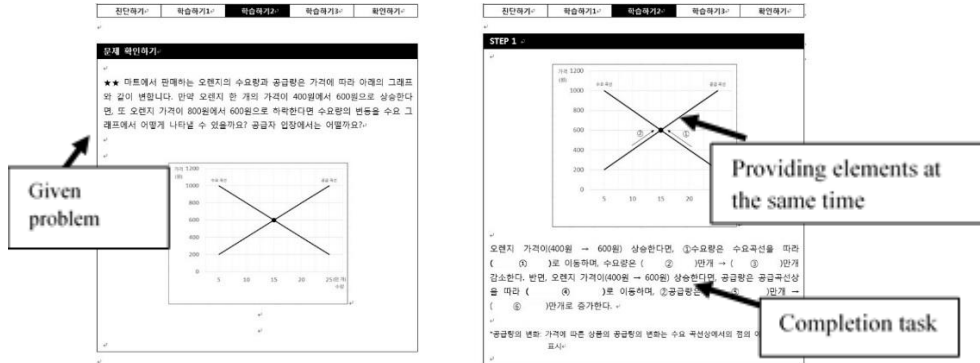


Figure 1: Example Frames from completion task group for learning phase

Experimental Instruments

Pretest

A pretest was conducted to confirm the homogeneity among the three treatment groups by measuring their prior knowledge of the subject. The test examined the subjects' knowledge about basic supply and demand concepts, the law of supply and demand, and the supply and demand curves. There were 13 questions consisting of 6 true-false questions, 3 pairing questions, and 4 short-answer questions, each of which was worth 1 point.

Retention test

The retention test was consisted of 8 items consisting of 1 multiple choice questions, 4 true-false questions, 1 descriptive question, 1 question in which the participant had to draw a supply and demand curves chart, and 1 question in which the participant had to shift the supply and demand curves.

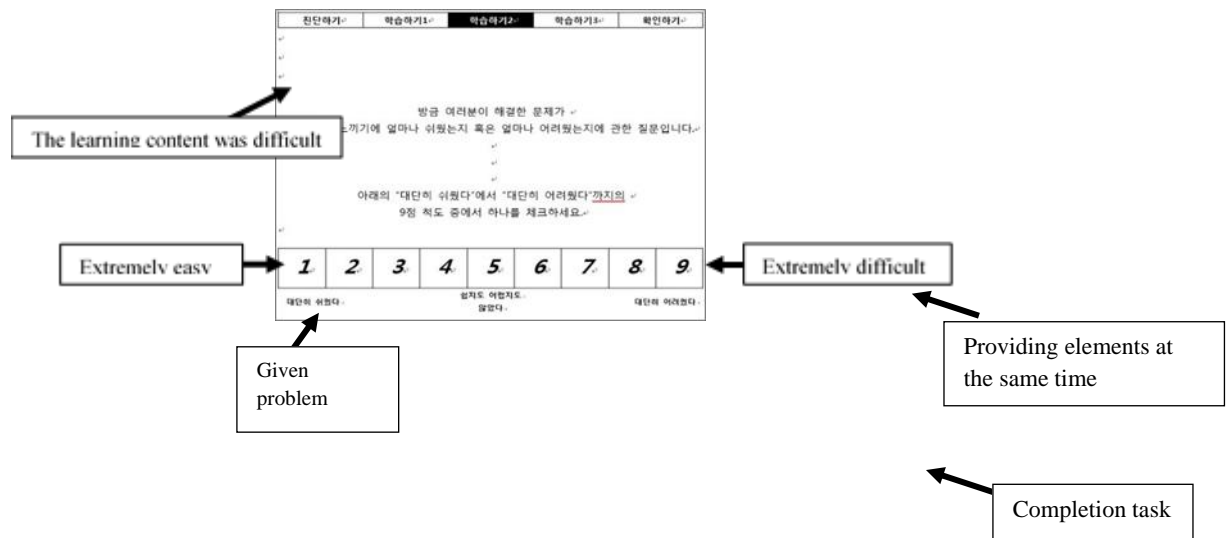
Transfer test

Transfer is the process in which a learner applies what they have learned to an authentic problem (Johnson & Mayer, 2009). The transfer test consisted of one descriptive question, which was taken from the Korean Educational Broadcasting System self-study book and was adjusted for the purposes of the study. In the process of taking the transfer test, learners were required to analyze a newspaper report and apply what they had learned about supply and demand to as an authentic problem.

Cognitive load

Learners' perceived cognitive load was measured using a self-reported questionnaire developed by Paas and van Merriënboer (1994). The questionnaire consisted of a nine-point Likert scale, ranging from ranging from "extremely easy" (1) to "extremely difficult" (9), see [Figure 2].

Figure 2: Mental effort rating scale



Experimental Design and Procedure

Participants were randomly assigned to one of three instructional conditions: 1) restudy condition ($n = 26$), which had restudy phase after studying worked examples; 2) conventional problem solving condition ($n = 26$), which had a test in which learners had to solve a conventional problem after studying worked examples; and 3) completion task condition ($n = 22$), which had a completion task after studying worked examples. There were two sessions in the experiment. The first session was composed of the pretest, the learning phase, cognitive measurement, and the retention test. During the learning phase, the participants studied complex tasks with worked examples and completed their particular intervening activity. Cognitive load tests were conducted after the learning phase to measure the load that they had experienced. The retention test was conducted last. The second session took place a week after the first session during which all groups took the same transfer test, see [Table 2].

Table 2: Procedure of experiments

Session	Phase	Objectives	Procedure			time
First session		Pre-test	Group Equivalence test			5min
		Study1	Studying with a worked example			8min
		Intervening activity1	Restudy	Conventional problem solving	Completion task	8min
	learning phase	Study2	Studying with a worked example			8min
		Intervening activity2	Restudy	Conventional problem solving	Completion task	8min
		Study3	Studying with a worked example			8min
		Intervening activity3	Restudy	Conventional problem solving	Completion task	8min
		Measurement	Perceived Cognitive load			2min
			Retention test			8min
	Testing phase	Final test	Transfer test (after 1 week)			5min
Second session						

Data analysis

The data collected for the study were analyzed using an ANOVA test to examine the effect of each test format on learning outcomes and cognitive load. The analyses were conducted using the Statistical Package for Social Sciences. The significance level was set at $\alpha = 0.05$.

Table 3: Experiment instrument and data analysis method

Dependent variables		Number of Item	Data collection	Sources	Cohen Kappa(κ)	Cronbach's alpha
Learning outcomes	Retention test	8	Scores of test	-	-	.769
	Transfer test	1	Content analysis	-	.908	-
Cognitive load	Perceived Cognitive load	1	Self-report questionnaire	Paas and van Merriënboer (1994)	-	.769

RESULTS

RQ1. What are the effects of test formats after studying with worked examples on complex task learning outcomes?

Table 4: Means and standard deviations of dependent variables across groups

	Restudy (n=26)		Conventional problem solving (n=26)		Completion task (n=22)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Retention test score	4.00	2.37	4.54	2.15	3.18	2.30
Transfer test score	2.92	2.11	4.73	2.23	4.05	1.88
Cognitive load	4.73	1.97	6.65	1.46	5.05	1.21

Note: *M* = Mean, *SD* = Standard deviation

Table 5: ANOVA for test formats on learning outcomes

<i>Sources</i>		<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>ES(η²)</i>
Retention	Between	22.05	2	11.03	2.13	.127	
	Within	367.73	71	5.18			
	Total	389.78	73				
Transfer	Between	43.22	2	21.61	4.92*	.010	.122
	Within	311.92	71	4.39			
	Total	355.14	73				

Note: *SS* = Sum of squares, *df* = Degree of freedom, *MS* = Mean square, **p* < .05, ***p* < .01, ****p* < .001

To answer the first research question, a one-way ANOVA with test format as the independent variable were with retention and transfer learning outcomes as the dependent variables. No significant differences between the three conditions' effects on the retention test were found ($F(2, 71) = 2.129, p = .127$). However, the differences among the three groups' effects on the transfer test were significant ($F(2, 71) = 4.919, p = .010, \eta^2 = .122$). A post hoc analysis was performed to examine the specific differences in achievement between the experimental conditions. A Scheffe test showed that participants in the conventional problem-solving group performed better than those in the restudy group (mean difference = 1.808, $p = .011$), whereas no significant difference was found between the completion task and restudy groups and the conventional problem-solving condition group (mean difference = 1.122, $p = .188$; mean difference = -.685, $p = .532$, respectively), see [Table 5].

To confirm these effects, an additional orthogonal contrast test was conducted (orthogonal contrast rate: restudy: -1, completion task: .5, conventional problem solving: .5) on the retention and transfer tests. There was no difference between the restudy and test practice condition groups, including conventional problem solving and completion task groups, on retention test ($t(71) = -.252, p = .802$), but the test practice condition groups had significantly higher transfer test results than the restudy group ($t(71) = 2.867, p = .005$).

RQ2. What are the effects of test formats after studying with worked examples on cognitive load?

Table 6: ANOVA for test formats on cognitive load

<i>Sources</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>ES(η²)</i>
Between	54.55	2	27.27	10.64***	.000	.231
Within	181.96	71	2.56			
Total	236.50	73				

Note: *SS* = Sum of squares, *df* = Degree of freedom, *MS* = Mean square, **p* < .05, ***p* < .01, ****p* < .001

This research question aimed to reveal the effect of the experimental conditions on perceived cognitive load during the learning phase. A one-way ANOVA confirmed that there was a significant difference between the cognitive load imposed on learners by each of the three experimental conditions ($F(2, 71) = 10.642, p < .000, \eta^2 = .231$). Post hoc Scheffe tests revealed that subjects in the conventional problem solving group reported significantly higher cognitive load than those in the completion task and restudy groups (mean difference = 1.608, $p = .004$, mean difference = 1.923, $p < .000$, respectively). In contrast, there was no significant difference in reported cognitive load between the completion task and restudy condition groups (mean difference = .315, $p = .795$), see [Table 6].

To precisely examine the testing effect on perceived cognitive load, orthogonal contrasts (orthogonal contrast rate: restudy: -1, completion task: .5, conventional problem solving: .5) were conducted and revealed that test practice condition groups, including conventional problem solving and completion task groups, imposed significantly higher cognitive loads than restudy conditions ($t(71) = 2.867, p = .005$).

RQ3. Are there any differences between completion tasks and conventional problem solving in learning outcomes and cognitive load?

Table 7: T-tests for test formats on learning outcomes and cognitive load

<i>Dependent Variables</i>	<i>Mean difference</i>	<i>95% CI</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES(d)</i>
Retention	1.357	(.059, 2.654)	46	1.842	.072	
Transfer	.685	(-.531, 1.901)	46	1.134	.263	
Cognitive Load	1.608	(.817, 2.400)	46	4.088	.000***	1.19

Note: 95% CI: 95% of Confidence interval, *df* = Degree of freedom, *MS* = Mean square, * $p < .05$, ** $p < .01$, *** $p < .001$

Exploration of the third research question was intended to generate empirical evidence by comparing between effectiveness of doing completion tasks or engaging in conventional problem solving after worked examples. To answer this question, independent T-tests were conducted on the completion task and conventional problem-solving groups. There were no differences in learning outcomes (retention: $t(46) = 1.842, p = .072$; transfer: $t(46) = 1.134, p = .263$). On the other hand, the completion task group experienced less cognitive load than the conventional problem solving group ($t(46) = 4.088, p < .001, d = 1.19$). Considering both learning outcomes and cognitive load, the completion task condition was found to be a more effective test format when engaging in complex learning.

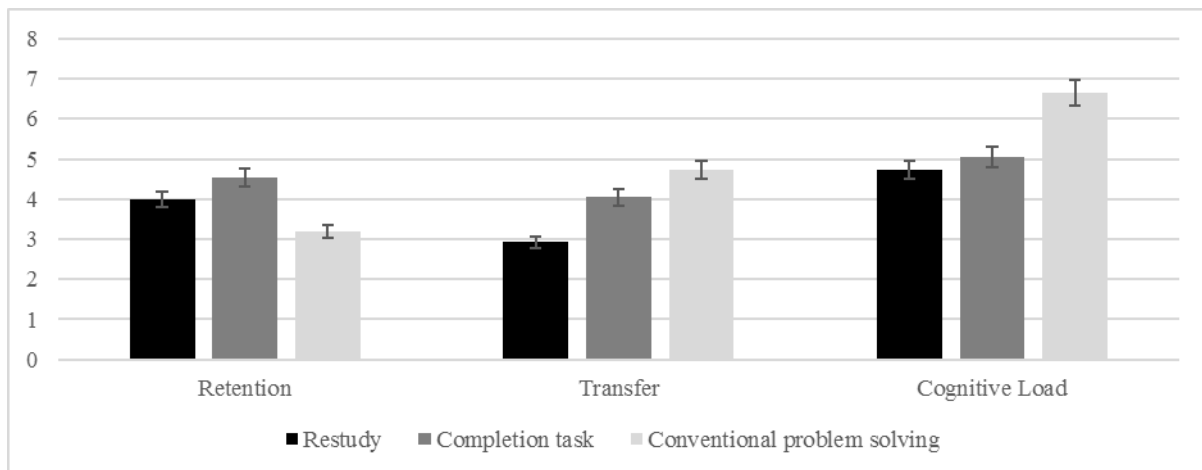


Figure 3: Means and standard deviations for learning outcomes and cognitive load by test formats

CONCLUSIONS AND DISCUSSION

This study investigated the effect of restudy, conventional problem solving, and completion task test formats, which were presented after learners were given worked examples, on retention and transfer as learning outcomes and perceived cognitive load.

First, the current study supported earlier testing effect studies (Karpicke & Aue, 2015; Smith, Blunt, Whiffen, & Karpicke, 2016). According to the orthogonal contrast test (orthogonal contrast rate: restudy: -1, completion task: .5, conventional problem solving: .5), there was no significant difference between test practice conditions group, including completion tasks and conventional problem solving, and restudy condition on retention ($t(71) = -.252, p = .802$), while the subjects in the test practice condition groups outperformed those in the restudy group on the transfer test ($t(71) = 2.867, p = .005$). This result aligned with the previous studies which showed that there was no difference on immediate retention test performance between restudy and test practice condition groups (Roediger & Karpicke, 2006a; Johnson & Mayer, 2009). This finding indicates that test practices seem to foster transfer during complex learning.

Second, the test practice conditions imposed more cognitive load than the restudy condition (orthogonal contrast test: restudy: -1, completion task: .5, conventional problem solving: .5; $t(71) = 2.867, p = .005$). These results strongly support the existence of the worked example effect (Atkinson, Derry, Renkl, & Wortham, 2000; van Gog et al., 2015), which reduces unnecessary cognitive loads when learners solve problems with less or no guidance

Lastly, with regard to learning outcomes, there were no significant differences between the completion task and conventional problem solving condition (retention test results: $t(46) = 1.842, p = .072$; transfer test results: $t(46) = 1.134, p = .263$). On the other hand, the completion tasks condition group reported less cognitive load than the conventional problem solving condition group ($t(46) = 4.088, p < .001, d = 1.19$). This finding aligns with earlier studies that showed that abrupt transitions from studying fully worked-out problems to solving conventional problems can increase cognitive load (Renkl, Atkinson, Maier & Staley, 2002). Providing completion tasks that bridge the gap between worked examples and conventional problem solving may reduce cognitive load (Renkl & Atkinson, 2010). These findings suggest that, in terms of learning outcomes and cognitive load, completion tasks are a more efficient test format than conventional problem solving when learning complex tasks.

There are several limitations to the current study that should be addressed in future studies. First, each cognitive load component (i.e., intrinsic, extraneous, and germane cognitive loads) should be measured independently. This research only measured the total amount of perceived cognitive load through subjective self-reporting, which means that this data cannot be used to optimize the three different kinds of cognitive loads by reducing intrinsic and extraneous cognitive loads and promoting germane cognitive loads.

Furthermore, learning environments that use varieties of learning strategies are needed to encourage students to engage in various kinds of tests besides written test format. Although test practice has been proven effective at improving learning outcomes, students do not easily adopt these strategies due to affective burdens. Therefore, various test formats, such as self-explanation and peer retrieval practice, that can replace written tests and their effects on complex learning outcomes should be studied.

REFERENCES

- Adesope, O. O., Trevisan, D. A., & Sundararajan, N. (2017). Rethinking the use of tests: A meta-analysis of practice testing. *Review of Educational Research*. Advance online publication.
- Atkinson, R. K., Derry, S. J., Renkl, A., & Wortham, D. (2000). Learning from examples: Instructional principles from the worked examples research. *Review of Educational Research*, 70(2), 181-214.
- Fiorella, L., & Mayer, R. E. (2016). Eight ways to promote generative learning. *Educational Psychology Review*, 28(4), 717-741.
- Johnson, C. I., & Mayer, R. E. (2009). A testing effect with multimedia learning. *Journal of Educational Psychology*, 101(3), 621-629.
- Jung, J., Kim, D., & Na, C. (2016). Effects of WOE presentation types used in pre-training on the cognitive load and comprehension of content in animation-based learning environments. *Journal of Educational Technology & Society*, 19(4), 75-86.
- Kalyuga, S. (2011). Cognitive load theory: How many types of load does it really need? *Educational Psychology Review*, 23(1), 1-19.
- Karpicke, J. D., & Aue, W. R. (2015). The testing effect is alive and well with complex materials. *Educational Psychology Review*, 27(2), 317-326.
- Karpicke, J. D., & Roediger, H. L. (2008). The critical importance of retrieval for learning. *Science*, 319(5865), 966-968.
- Leahy, W., Hanham, J., & Sweller, J. (2015). High element interactivity information during problem solving may lead to failure to obtain the testing effect. *Educational Psychology Review*, 27(2), 291-304.
- Paas, F. G., & Van Merriënboer, J. J. (1994). Instructional control of cognitive load in the training of complex cognitive tasks. *Educational psychology review*, 6(4), 351-371.
- Plass, J. L., Moreno, R., & Brünken, R. (2010). *Cognitive load theory*. Cambridge University Press.
- Renkl, A., & Atkinson, R. K. (2010). *Learning from worked-out examples and problem solving*. In Cognitive load theory. Cambridge University Press.
- Renkl, A., Atkinson, R. K., Maier, U. H., & Staley, R. (2002). From example study to problem solving: Smooth transitions help learning. *The Journal of Experimental Education*, 70(4), 293-315.
- Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning - Taking memory tests improves long-term retention. *Psychological Science*, 17(3), 249-255.
- Smith, M. A., Blunt, J. R., Whiffen, J. W., & Karpicke, J. D. (2016). Does providing prompts during retrieval practice improve learning?. *Applied Cognitive Psychology*, 30(4), 544-553.
- Sweller, J., Ayres, P., & Kalyuga, S. (2011). *Cognitive load theory*. New York: Springer.

- Van Gog, T., & Kester, L. (2012). A test of the testing effect: acquiring problem-solving skills from worked examples. *Cognitive Science*, 36(8), 1532-1541.
- Van Gog, T., Kester, L., Dirkx, K., Hoogerheide, V., Boerboom, J., & Verkoeijen, P. P. J. L. (2015). Testing after worked example study does not enhance delayed problem-solving performance compared to restudy. *Educational Psychology Review*, 27(2), 265-289.
- Van Merriënboer, J. J., & Sweller, J. (2005). Cognitive load theory and complex learning: Recent developments and future directions. *Educational psychology review*, 17(2), 147-177.
- Zaromb, F. M., & Roediger, H. L. (2010). The testing effect in free recall is associated with enhanced organizational processes. *Memory & Cognition*, 38(8), 995-1008.

Online Course Evaluation System Adoption in Higher Educational Institutions: Evidence from an Emerging Country

Augustus Barnnet ANDERSON

*Department of Operations and Management Information Systems
University of Ghana Business School
Ghana
baanderson@st.ug.edu.gh*

Richard BOATENG

*Department of Operations and Management Information Systems
University of Ghana Business School
Ghana
richboateng@ug.edu.gh*

Eric ANSONG

*Department of Operations and Management Information Systems
University of Ghana Business School
Ghana
eansong003@st.ug.edu.gh*

ABSTRACT

Course evaluation in the educational industry is undergoing constant changes due to the rapid development of technology and the role it plays in the industry. The study seeks to understand why Higher Educational Institutions (HEIs) migrate their traditional course evaluation process to online course evaluation systems. Using a qualitative, interpretive case study methodology, this study examines the migration of traditional course evaluation process to an online course evaluation system from a developing country perspective. It was therefore discovered that Higher Educational Institutions migrate from the traditional to online course evaluation systems in order to save time, cost, and environmental influences and to increase efficiency and effectiveness. The study contributes to the body of knowledge on the adoption of online course evaluation systems by outlining what causes HEIs to adopt an online course evaluation system from a developing country perspective. This serves as a guide to other institutions that will want to adopt the online course evaluation system. Arguably, it is arguably one of the first empirical study on the adoption of online course evaluation systems that has been conducted from a developing country perspective.

Keywords – Online Course Evaluation System, Information Systems, Higher Educational Institutions (HEIs), Performance Evaluation, Developing Country, Ghana

INTRODUCTION

The act of student evaluating teaching is a prevailing development in Higher Educational Institutions (HEIs). In most HEIs in Africa, students evaluate courses for formative purposes, that is, to serve as a feedback mechanism to faculty for instructional improvement (Blair & Kimila, 2014). According to Lin and Pervan (2001), evaluation is a process that suggests planning and treatment by providing feedback information and contributing to organizational development. Evaluation of the performance of lecturers by students started as early as 1915 (Bemile, Jackson, & Ofosu, 2014). Zanin-Yost and Crow (2012) stated that, the quality of student learning although not exclusive, is directly related to the quality of teaching. In efforts to improve educational outcomes for students and increase accountability for teachers, there is the need to evaluate courses taught by lecturers.

Course Evaluation in the educational industry is undergoing constant changes due to the rapid devolvement of technology and the role it plays in the educational industry (Johnson, 2003).

The evaluation process is now virtualized, that is, it is being migrated from the physical environment to the virtual environment known as the online course evaluation. Prior research on online course evaluation systems have come to the conclusion that online surveys are more resource-efficient and offer greater convenience, ease of use, and student satisfaction (Donovan, Mader, & Shinsky, 2007). Studies on evaluation of course evaluation has been conducted from different scopes which focuses more student and faculty perceptions of course evaluations, the validity and reliability of course evaluations, online versus paper course evaluations and effects of allowing students access to course evaluation data (Adam, 2009; Ahmad, et al., 2012; Annan S. , Tratnack, Rubenstein, Metzler - Sawin, & Hulton, 2013; Dorit, McClean, & Nevo, 2012; Azizah, et al., 2011; Donovan, Mader, & Shinsky, 2007). Few studies have been conducted on the online versus paper course evaluations from a developing country's perspective (Anderson, Jeff, & Eleanora, 2005; Donovan, Mader, & Shinsky, 2007; Avery, Bryant, Mathios, Kang, & Bell, 2010; Bemile, Jackson, & Ofosu, 2014; Nicole, Steven, & Erin, 2007). However, all the above studies on the online versus paper course evaluations concentrated on comparing the paper-based system to the online course evaluation system in order to identify the importance of the online system over the paper-based system leaving out the migration process of the paper-based to the online system. This study instantiates with a specific case study in the context of a developing country "Ghana" to understand why higher educational institutions migrate from traditional to online course evaluation system. The next section presents the review of literature.

LITERATURE REVIEW

This section reviewed literature on performance evaluation since the course evaluation is a form of performance evaluation. The section then gives an overview of course evaluation and discusses it types.

Performance Evaluation

In a competitive society, every organization strives to attain stable development and survival of which the higher educational institutions are not exempted (Jalaliyoon & Taherdoost, 2012). Higher Educational Institutions have become more accountable to its stakeholders due to the increased public interest in their performance (Bisao, 2009). This can be attributed to the modern knowledge based economy where higher educational institutions serve as the centres for developing human resource. Thus, playing an essential role in countries' economic growth and development (Jalaliyoon & Taherdoost, 2012). In higher educational institutions, course evaluation serves as a type of performance evaluation for both lecturers and the courses they teach (Donovan, Mader, & Shinsky, 2007).

Overview of Course Evaluation

Course evaluation is an important means of assessing courses, lecturers and providing formative feedback for future improvement of a course or mode of teaching (Blair & Kimila, 2014; Donovan, Mader, & Shinsky, 2007). Course evaluations have undergone major shifts in the last century. It has changed along with beliefs and values concerning the role of teachers, effective teaching and modes of evaluation, and theories of student learning (Ellett & Teddlie, 2003). There are two main modalities for course evaluation. These are the traditional and Web – based (online) Course evaluation (Ardalan, et al., 2007; Thorpe, 2002).

Traditional Course Evaluation

The traditional modality of Course Evaluation is also known as the paper – based course evaluation. Ardalan et al. (2007), discussed in their study that, traditionally, universities have used paper-and-pencil surveys to collect students' feedback. Normally, a portion of a regular lecture session is devoted to the distribution, completion and collection of the paper-based surveys. The processing of data collected is difficult. Some studies describe it as expensive, time-consuming and prone to errors (Ardalan, et al., 2007).

Web – Based (Online) Course evaluation

Thorpe (2002) indicated that improvements in Information Communication technologies have caused the paper – based course evaluation system to be moved to online platforms, making an online course evaluation a norm for most HEIs. A Web – based course evaluation is an electronic questionnaire, which requires a written or selected response answer to a series of questions to evaluate the instruction of a given course. The benefits of having students to complete faculty evaluations online, compared to the traditional paper format include time and cost savings, less susceptibility to influences, and faster reporting of results (Alauddin & Kifle, 2014; Alessia & Crow, 2012; Blair & Kimila, 2014).

Migration from traditional to online course evaluations systems have received greater research attention in developed economies like Texas (David, Denise & Robert, 2010), California (David & Matthew, 2010); Indiana (Donovan, Mader & Shinsky, 2006), Australia (Alauddin & Kifle, 2014) and Canada (Saadé, 2003) than the developing economies such as Trinidad and Tobago (Blair and Kimila, 2014) and Ghana (Ansah, 2010). As a result, it is important that more studies should be conducted in the context of developing countries especially in African countries to validate and add to the findings of the few existing studies.

Most of the studies on online course evaluation have one thing in common; they are all conducted from the nursing, psychology and educational sector. There are few studies originating from the management information systems perspective. The dominant literature from this field is the studies conducted by Dorit, McClean and Nevo (2012) but their study was on the advantages offered by online Students' Evaluations of Teaching (SET). They used a Canadian university as a case study to identify critical success factors of online evaluations from students' point of view. Some of the factors identified as important by the students include anonymity, ease of use and accessibility. This was in line with a study conducted from a developing economy's perspective to assess whether students are ready to move to the online modality of course evaluation (Blair & Kimila, 2014). Virtualization of process in the educational sector for instance e-learning are a few of the studies in the literature which discusses how higher educational institutions virtualize the course evaluation process (Saadé, 2003). Hence, this study will contribute to the virtualization of course evaluation process.

RESEARCH SETTING AND METHODOLOGY

Research Setting

The setting for the research is the developing-country context of Ghana. The case study was based on "*University A*" (pseudonym), a Ghanaian university with a student population of thirty-five thousand, six hundred and eighty-three (35,683) as at September 2014 which represents a male-female ratio of about 3:2. "*University A*" aims to develop a world-class university through quality teaching, learning, research and knowledge dissemination hence to ensure quality teaching, the university formed the Academic Quality Assurance Unit (AQAU). The AQAU was formed to foster excellence and ensure the continuing quality of academic programs offered by the university. The responsibility of the unit which is of relevance to the study is Course Evaluation.

Methodology

This study employs the use of a qualitative, interpretive case study as its methodology in order to achieve the purpose of this research (Klein & Myers, 1999; Myers & Avison, 2002). Walsham (1995;1993) indicated that, interpretive case study in information systems research is aimed at researching into a phenomenon with the notion of understand interactions between information systems phenomena and their real-life contexts. This is in line with information systems research as other authors argue that it should examine the interactions of the social system (users and context) and the technical, in our case the online course evaluation system (Weißenfels, Ebner, Ebner, & Smolnik, 2016; Avgerou, 2000). The philosophical assumptions (ontological and epistemological perspective) underpinning the interpretive paradigm are that reality and knowledge are socially constructed between researchers and their participants, making both subjective in the research phenomenon, process and output (Klein & Myers, 1999; Orlikowski & Baroudi, 1991). Drawing from the qualitative, interpretive case study, this study seeks to understand the interaction between the online course evaluation system and its environment. The justification for choosing the qualitative, interpretive case study approach is the ability to aid in getting in-depth understanding from the research phenomenon to be studied and its environment.

Data gathering

Based on the tenets of the interpretive paradigm and case study research, this study employs evidence from multiple sources to support the research findings – this strategy is known as data triangulation (Walsham, 2006;1995). Data for this study was gathered from 2014 to 2015 through artefact analyses, observations, Internet searches, focus group discussions, archival records and formal and informal interviews. Using a purposive sampling technique, a total number of fifty-four (54) participants were interviewed for this study. The breakdown of the participants are forty (40) students, ten (10) lecturers and three (3) Administrative staff from the AQAU and a Webmaster in the “University A” Computing Systems. Each interview lasted for an hour, with the consent of the participants, each interview session was tape-recorded and afterward transcribed after the fieldwork. The preliminary findings were presented to the participants through a workshop for verification of findings and feedback from participants.

Data Analysis

Analysis of the data was carried out both during and after data collection (Myers, 2009; Walsham, 1995, 2006). The researcher adopted the qualitative thematic analysis (Ryan & Bernard, 2003) which involves carefully reading, summarizing, reflecting and categorizing the data into emerging thematic segments (Miles & Huberman, 1994). The researcher followed the above process to induce themes on why higher educational institutions adopt online course evaluation systems. To ascertain the authenticity, plausibility and criticality of the analysis, as these emergent themes were identified, the researcher went back to the field to discuss it with participants and verify the findings (Walsham, 2006). This is in line with interpretive studies where data can be collected and analyzed simultaneously and iteratively (Baxter & Jack, 2008).

THE CASE OF “UNIVERSITY A”

The traditional Course Evaluation System

Until 2013, “University A”, like most Ghanaian universities used paper-based evaluation method (traditional system) to collect student feedback on both lecturers and courses taught. This traditional system was conducted in the last week of the teaching period of each semester. Portions of the regular lecture session are devoted to the distribution, completion and collection of the paper-based questionnaires. The sample for the evaluation depended on the class attendance for that single session. Students who are not in class during the session miss the opportunity to evaluate. This was established by the Assistant Registrar of the AQAU who indicated that;

“The Paper-Based questionnaires were usually brought to the lecture room, usually during the last lecture session of every course, and a portion of the lecture period is dedicated to the filling of the questionnaires. The questionnaires are normally distributed to students by the teaching assistants of the lecturer and students are given a short period of time to fill and submit the questionnaires”.

These printed questionnaires are typically a mixture of scaled, closed-ended and open-ended questions. The responses to closed-ended questions can be quickly recorded using a widely available scanning technology called the Photo scribe PS900. This set of scaled responses would then be processed as quantitative feedback. The open-ended questions, such as “Please comment on this course” and the semi-open-ended questions, such as “Any comments or suggestions for future improvement?” would elicit written comments from the students.

The Assistant Registrar further indicated,

“At times, because of the comments recorded in parts of the questionnaire, we hire the services of extra staff to type the comments and others to scan the forms. This tends to delay the evaluation process, and always has backlogs of unprocessed data from the previous semester.”

These comments would require manual transcription to provide readability for this handwritten material and, more importantly, to provide anonymity for the student respondents. This set of comments would then be assembled as qualitative feedback. The AQAU hires the services of extra personnel to manually type these comments. The processing of this qualitative feedback, requiring transcription, is one of the major disadvantages of this method, because it is expensive, time-consuming and usually prone to error.

Analysis is conducted on the collected data to determine the performance of the lecturers and how the course was delivered.

From the data collected as valid, an average response rate of at least 60 percent is required. Where feedback is low, departments give consideration to ways in which the response rate might be improved. Departments monitor the response rate and take it into account when evaluating the feedback and developing the action plan.

At the end of every evaluation process, a summary of the analyzed data and a copy of the unedited subjective or written portion are sent to the lecturer concerned. Copies of the same materials are sent to the lecturer's Head of Department and Dean. The Director of AQAU is required to send comments on the analyzed data to the Dean concerned. Everything is done under strict confidentiality. Heads of the departments are required to discuss their evaluation report with the teaching staff. Deans are required to talk to teaching staff whose output is found to be below expectation.

Decision for Online Course Evaluation System

It was ascertained that the paper-based method of evaluation was somewhat flawed, as the top management of the AQAU responsible for overseeing the printing and distribution of these questionnaires indicated that the cost of using the paper-based questionnaire was very high. The cost included the printing the questionnaire. This is because the printing is not done in-house, it was usually outsourced. Most of the time, the printing of the questionnaires is delayed and this also delays the whole evaluation process. There are occasions when some courses are not evaluated because of the non-availability of forms.

Both the Research Assistant and the Assistant Registrar indicated that;

"The Cost involved in printing the paper-based forms was so high, take one student offering six courses, the person is supposed to fill at least five forms. Take this number and multiply with the total population of the University, which is around thirty-eight thousand (38,000). So each Semester we end up printing approximately one hundred and ninety thousand (190,000) forms, and there are occasions they have run out of forms."

The cost of distributing them to each Faculty throughout the "University A" campuses was so high. Hence, the unit devised a plan where the various faculties were called upon to pick up their evaluation forms from their main office when it was ready. But it was noted that most faculties delayed in going to their forms, resulting in the delays of the evaluation process. Furthermore, there was always a huge cost associated with collecting, scanning and storing the paper evaluation forms. Also, the costs of typing students' responses to open-ended questions and the costs of delivering hardcopy summary reports to Faculty were so high. This was ascertained by the Assistant Registrar of the Academic Quality Assurance Unit.

He declared;

"Take the case of a student offering six courses. The student is supposed to fill at least five forms. Take this number and multiply it by the total population of the University, which is around thirty-eight thousand (38,000). Simply put, the unit ends up printing approximately one hundred and ninety thousand (190,000) forms every semester."

Finally, there was high administrative cost in processing this large number of questionnaires. Since they were paper-based, they had to be collected and scanned manually using the Photo Scribe Series PS900 Machine. The Photo Scribe Series PS900 is an image-capturing device that is used to scan or capture data, and conduct validation and key correction of the scanned data. It then exports the scanned and corrected data into an ASCII or Text format which is suitable for electronic processing. And since it was just one machine being used, it took an unusually long time to scan all the questionnaires. On some occasions, the scanner could break down several times and it costs a lot to repair it. This causes various inconveniences and undue delays.

Furthermore, there was the pressing issue of time. It always took a long time for all the questionnaires to be scanned, and this led to the late provision of the results. Most of the time, there were backlogs of the un-scanned questionnaires from the previous semester into new semesters. The photo scribe PS 900 scanner could capture only the Likert scale questions. For the open-ended questions, other staff had to be employed overtime to type all the responses and most of the time there were some typographical errors. Also, the processing time for the evaluation was prolonged. On several occasions, deadlines for scanning a semester's questionnaire were not met. During this same time, another set of questionnaires would be available to be processed. Hence, there was always a problem of having backlog questionnaires from the previous semester to scan.

Also, there is the issue of environmental forces. With the University aiming to be a world class institution, it will be feasible to throw away the traditional mode of doing things and adopt contemporary methods, which are more resource efficient.

This was ascertained by the Assistant Registrar as he indicated that;

“Looking at all the big universities in developed countries, most of them are adopting the online system. So, it will be plausible for “University A” to adopt such a system if the university really wants to compete with the “outside Universities””

Finally, there was also an issue of the difficulty in modifying the existing questions for the evaluation. For instance, an interview with some of the Faculty members indicated that the evaluation questionnaire did not capture innovation. By so doing, it becomes difficult to assess Faculty members on innovative ways of teaching. The paper-based questionnaire is such that it is difficult to be modified. The cost of printing the forms are very high. This made the evaluation questions difficult to be modified. As a matter of fact, the same questionnaire has been used over five years. Even, though it was rare, some students indicated that the paper-based evaluation process is susceptible to Faculty influence. This is because in a typical paper-based evaluation process, it is possible that the Faculty member might perform on the day of the evaluations some activity that is designed to elicit a favorable response from students or in some cases just the presence of the Faculty member before or during the evaluation process may either influence or intimidate the students, especially if the student fears that the Faculty member may have some way of identifying the student’s response.

In view of the above problems, in 2011 there were recommendations from some Heads of department to virtualize the paper-based Course Evaluation system. In 2012, a decision was made to develop the online Course Evaluation system. Since the university has an internal computing unit, the Assistant Registrar of AQAU sought the assistance of the webmaster of the university’s Computing Systems. The online system was developed in-house by the webmaster and his Unit comprising of a database programmer and a graphic designer. It took four (4) months to develop the online Course Evaluation system.

The Online Course Evaluation System

As noted earlier, course evaluations are carried out in the last week of Lectures. Before evaluation period, a memo is sent from the AQAU to all Faculty members of the University, reminding them of the evaluation of courses and lecturers. Also, some of the memos are sent to students through the University’s electronic mail. During the evaluation period, a link directing students to the evaluation page is put on the university’s website and AQAU homepage. When students click the link, it takes them to a one-page questionnaire item, with four sections. In the first section, the student chooses his or her campus, course code, name of the lecturer (s), academic year, and semester from a dropdown menu. The student then moves to the second section that is the Course Evaluation section, which is a questionnaire item on the course. The next section is on Lecturer Evaluation, which covers questions that are asked about the attendance of the lecture and how the lecturer delivered the course. The final section is to provide qualitative comments. Students are given the opportunity to add the comments and suggestion for improving the course and its mode of delivery. After filling the questionnaire, the student clicks on the submit button at the bottom of the page and his or her form is saved in the database.

REASONS FOR ADOPTING THE ONLINE COURSE EVALUATION SYSTEM

Reduced Processing Time

First and foremost, unlike the paper-based course evaluation system that took longer to process, approximately four to five months. The online Course Evaluation shortens this processing time for a day’s job. For the online course evaluation system, there is no need to print over eighty thousand questionnaires, distributing and scanning after it has been filled. This tends to take away the flaws of backlogs. Also, for the online system, there is no need to hire the services of extra personnel to type in the comments of the students. This tends to prevent typographical mistakes. Since the collected data could be analyzed within days, this substantially reduces the time for lecturers to receive their reports and enable them to quickly act upon the students’ evaluation. The time and resources used in processing the data can be diverted to other projects.

Reduced Operational Cost

From the research findings, it is ascertained that, the online Course Evaluation system is very cost effective. It takes away the cost of printing over one hundred and eighty thousand evaluation forms, each semester as compared to the paper-based Course Evaluation system. Cost is an important consideration for institutions of higher Education. Notwithstanding that, the online Course Evaluation system also tend to take away the cost of distributing these evaluation forms throughout the various campuses. All these funds can be diverted to fund other projects in the university. Finally, there is reduced administrative cost unlike the typical paper-based Course Evaluation process which is a labor-intensive process. The funds that would have been channeled into the hiring of extra personnel to process the data and the cost of repairing the scanners if they break down can be diverted to other pressing needs of the unit.

Easy modification of Evaluation Questions

From the research findings the AQUAU has the flexibility in the questionnaire design, which is the ability to easily change the items on the evaluation forms. Unlike the paper-based course evaluation system, the questions for the evaluation can easily be modified without any implications. For instance, the current evaluation system did not capture how innovative the lecturers were in class. Hence, the academic quality assurance unit has decided to add technological innovation of lecturers to the evaluation and it was done with ease. If the University was still using the paper-based system, it would have been difficult to modify the system for a new set of evaluation forms to be printed. Also, the field for capturing comments is limited or has fixed length in paper-based forms. But with the online system this limitation is eliminated.

The ability for students to evaluate at their convenient time

Students have the flexibility to fill the online evaluation forms at their own pace, that is as and when they want to fill it. The online course evaluation system affords students with flexibility in completing their evaluation forms provided they have access to a computer and the Internet. Enabling students to complete the form at their own convenience increases the likelihood that students will have the time needed to consider their rating and write all that they want to say in the student comments section.

Environmental Forces

Another factor that influenced the “*University A*” to virtualize the physical process of its Course Evaluation is the environment. Environment in this context refers to aggregates of conditions or forces that influence or shape “*University A*”. The environmental forces are classified into two (2). The external environment of “*University A*” refers to its competitive forces. With the notion of developing into a world class university, there is the need to act accordingly since virtualizing the course evaluation process is a contemporary phenomenon which most western school are adopting. Another internal environmental factor is the growing population of “*University A*”. The University has experienced a tremendous growth in its population to about forty-two thousand, six hundred and ninety-two (42,692) and looking at this growth rate the paper-based method of Course Evaluation will not suffice.

Accessibility

Accessibility from the research findings can be viewed in two strands. Accessibility on the part of the students and accessibility on the parts of lecturers. Comparing the paper-based course evaluation system to the online system, most students tend to miss the opportunity to evaluate the courses when they are not at lectures during the day of the evaluation. Since the evaluation for a course is done only once in a semester most of the student’s perspective may not be captured. But this is not so with the online course evaluation system, the students will have a long time, whether at lectures or not to voice out their grievances during the evaluation period. All of the students in the class tend to have equal access to the online course evaluation system. None of the students will miss this opportunity to evaluate because they are absent from class. Furthermore, lecturers can have access to the evaluation report within a short period of time as compared to the paper-based evaluation method and it will aid in informing how they teach the next semester.

DISCUSSION OF FINDINGS

Reasons Higher Educational Institutions adopt online course evaluation system

Reduced Cycle Time for Processing

The issue of time can be viewed along the line of reducing the processing time of the paper-based course evaluation system. As earlier indicated, the processing of the data from the paper-based evaluation system in “*University A*” can take approximately four to six months, hence feedback of the evaluation is not received on time. Again, there are always backlogs of unprocessed data from the previous semesters. Also, the cycle time is prolonged – the cycle time refers to the total time from the beginning to the end of the evaluation process. This includes the processing time, during the evaluation. It was also discovered that “an online ratings system can substantially shorten the time to receive ratings reports, thereby enabling teachers to consider and act on student feedback in a timely manner”. Also, Dorit, McClean and Nevo (2012) and Avery et al., (2010) also ascertain the above fact that the introduction of the online course evaluation system tends to reduce both the cycle time of the evaluation process hence increasing productivity.

Cost Effectiveness

From the analysis of the findings, it is observed that the online course evaluation system is very cost effective. There is a reduction in the operational cost. Thus, the online course and the lecturer evaluation system tend to take away the cost of printing the paper evaluation forms. It also tends to take away the cost involved in distributing the forms to the various colleges and departments and the cost of repairing scanning machines. Also, the extra cost involved in paying staff to scan the paper forms are eliminated when it comes to the online system. This is in line with the literature (Bemile, Jackson & Ofori, 2014; Johnson, 2003; Nikolaidis & Dimitriadis, 2014) where empirical finding suggests that, online course evaluation system is generally perceived as less expensive than paper-pencil evaluation systems. From the studies, automating the Course Evaluation process eliminates the paper costs and reduces personnel costs for processing rating forms. Bothell and Henderson (2003) have undertaken a rigorous cost study that points out that the overall costs for online systems is substantially lower than those for paper-based systems.

Accessibility Issues

From the study, it could be realized that the online course evaluation system offers the convenience to students to access the system as and when they want to during the evaluation period. This tends to leverage on a high and quality response rate, since students can take their time to fill the forms, unlike the paper-based evaluation forms that require students to be physically present for the evaluation. Usually, accessibility goes hand in hand with time constraint when it comes to the paper-based system. Students are required to fill the forms in class within a shorter period of time. In this study’s case, the allotted time for the paper-based evaluation is 10-15 minutes, hence, the students just rush through the filling of the forms at times preventing them from giving quality feedback. Furthermore, the online Course Evaluation system tends to give lecturers access to the evaluation report within a shorter period of time as compared to the paper-based evaluation (Alauddin & Kifle, 2014).

Flexibility

Another reason, higher educational institutions may pursue the development of an online Course Evaluation system is that, it offers the flexibility to easily adapt or change the evaluation questions at a lesser cost compared to the paper-based Course Evaluation system (Azizah et al., 2011). In some online rating systems, instructors are given the flexibility to adapt and personalize the rating forms. They can easily change or add questions (or both) to elicit feedback according to their individual needs. Of course, most institutions with online rating systems do not allow unlimited “teacher tinkering” with the form. The system has to ensure that the mandated items cannot be changed or eliminated by instructors.

CONCLUSION/IMPLICATION

The research extends the study on course evaluation (Adam, 2009; Avery et. al, 2010; Bemile, Jackson, & Ofosu, 2014) in developing countries by probing into the reasons for the migration to an online course evaluation system in higher educational institutions. This study pointed out that higher educational institutions migrate to an online course evaluation system because of the following: reduced cycle time for processing, Cost effectiveness, Accessibility, Flexibility and Environmental forces. The limitation of the study stems from its focus on a single case study in one developing country. However, it adds to the body of knowledge by bridging the gap in the area of adoption of online course evaluation system in developing countries like Ghana. Also, with the issue of practice, this study will guide and inform institutions that would want to migrate or adopt an online course evaluation system. Thereby, aiding in the decision to transition course evaluation process from the traditional system to the online system.

Even though the findings generated may be replicated in other institutions, this study focused on why HEIs adopt online Course Evaluation system using “University A” as a case study. Since HEIs differ in their process, the findings may differ, as a result, readers must be careful in generalizing the findings of the research since the context might make a difference. Finally, as online course evaluation systems move on to more accessible technologies like mobile phones or smart phones, future studies should concentrate on identifying which forces will enable or constrain such a process.

REFERENCES

- Adam, C. C. (2009). Evaluating college students' evaluations of a professor's teaching effectiveness across time and instruction mode (online vs. face-to-face) using a multilevel growth modelling approach. *Computers and Education*, 53(2), 429-435.
- Ahmad, K. M., Kamaruddin, A. T., Meor, Z. T., Shahrir, A., Hafizah, H., Dzuraidah, A., & Nasrul, A. A. (2012). Measurement of Course Evaluation for Lecturers of the Faculty of Engineering and Built Environment. *Procedia -Social and Behavioural Sciences*, 60, 358-364.
- Alauddin, M., & Kifle, T. (2014). Does the student evaluation of teaching instrument really measure instructors' teaching effectiveness? An econometric analysis of students' perceptions in economics courses. *Economic Analysis and Policy*, 8(152), 1-13.
- Anderson, H. M., Jeff, C., & Eleanora, B. (2005). Online Student Course Evaluations: Review of literature and a pilot study. *American Journal of Pharmaceutical Education* 69.
- Annan, S., Tratnack, S., Rubenstein, C., Metzler - Sawin, E., & Hulton, L. (2013). An Integrative Review of Student Evaluations of Teaching: Implications for Evaluation of Nursing Faculty. *Journal of Professional Nursing*, 10-24.
- Annan, S., Tratnack, S., Rubenstein, C., Metzler -Sawin, E., & Hulton, L. (2013). An Integrative Review of Student Evaluations of Teaching: Implications for Evaluation of Nursing Faculty. *Journal of Professional Nursing*, 29(5), 10-24.
- Ardalan, A., Ardalan, R., Coppage, S., & Crouch, W. (2007). A comparison of student feedback obtained through paper-based and web-based surveys of faculty teaching. *British Journal of Educational Technology*, 1085-1101.
- Avery, J. R., Bryant, K. W., Mathios, A., Kang, H., & Bell, D. (2010). Electronic Course Evaluations: Does an online delivery system influence student evaluations?. *The Journal of Economic Education*, 37(1), 21-37.
- Avgerou, C. (2000). IT and organizational change: an institutional perspective. *Information Technology & People* 13 (4), 234-262.
- Azizah, J., Shahryar, A., Azian, A. L., Thomas, P., Wan, N. A., Narimah, A., & Chan, S. L. (2011). Reliability of Student Feedback on the Course Teaching Evaluation System (CTES) and System Usability. . *Procedia Social and Behavioural Sciences* 18 (1), 24-32.
- Baxter, P., & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *The Qualitative Report*, 544-559.

- Bemile, R. K., Jackson, O. A., & Ofosu, J. B. (2014). Course and Lecturer Evaluation by Students at Higher Institutions: Review and Challenges (The Case of Methodist University College Ghana). *Open Science Repository Computer and Information Sciences, Online(open-access)*, 1-13.
- Bisao, R. (2009). *Evolution of Information Technology in Educational management*. Boston : Springer Publications.
- Blair , E., & Kimila , I. (2014). Student Evaluation questionnaire and the developing world: An examination of the move from hard copy to online modality. *Studies in Educational Evaluation* 40, 36-42.
- Chen, Y., & Hoshower, L. (2003). Student evaluation of teaching effectiveness: an assessment of student perception and motivation. *Assessment and Evaluation in Higher Education*, 28(1), 72-88.
- Creswell, J. W. (2009). *Research Design; Qualitative, Quantitative and Mixed Method Approaches*. US: Sage Publications.
- David, S. F., Denise, J. D., & Robert, J. C. (2010). Online vs. Paper Evaluations of Faculty: When Less is Just as Good. . *The Journal of Effective Teaching*, 238(1) , 42-54.
- Dommeyer, C. J., Baum, P., Chapman, K. S., & Hanna, R. W. (2002). Attitudes of Business Faculty Towards Two Methods of Collecting Teaching Evaluations: Paper vs. Online. . *Assessment & Evaluation in Higher Education*, 29(5), 455 - 462.
- Donovan, J., Mader, C., & Shinsky, J. (2007). Online vs. Traditional Course Evaluation Formats: Student Perceptions. . *Journal of Interactive Online Learning*, 6(3), 158-180.
- Dorit, N., McClean, R., & Nevo, S. (2012). Harnessing Information Technology to Improve the Process of Students' Evaluations of Teaching: An Exploration of Students' Critical Success Factors of Online Evaluations. *Journal of Information Systems Education*, 21(1), 13-21.
- Garcia-Valls, M., Cucinotta , T., & Lu , C. (2014). Challenges in real-time virtualization and predictable computing. *Journal of Systems Architecture* , 726-740.
- Grzegorz, M. (2012). Virtualization of Marketing. *Contemporary Management Research*, 195-204.
- Handwerk, P., Carson, C., & Blackwell, K. (2000). Online vs. Paper and Pencil Surveying of students: a case study. . *Proceedings of the 40th Annual Forum of the Association of Institutional Research* (pp. 49-59). Cincinnati, OH: New Directions for Teaching.
- Hmieleski, K. H. (2000). Barriers to on-line evaluation. . *Interactive and Distance Education Assessment (IDEA)*, 34 1-10.
- Jalaliyoon, N., & Taherdoost, H. (2012). Performance Evaluation of Higher Education; a necessity. *Procedia - Social and Behavioural Sciences*, 5682-5686.
- Johnson, D. T. (2003). Online Student Ratings: Will Students Respond? *New Directions for Teaching and Learning*, 96, 49-59.
- Klein, H. K., & Myers, M. D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly*, 23(1), 67-93.
- Lin, C., & Pervan, G. (2001). A review of IS/IT investment evaluation and benefits management issues, problems and processes. In S. Gembergen, *Information technology evaluation methods & management*. Hersey: Idea Group Publishing.
- Miles, M., & Huberman, A. T. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks CA: Sage.
- Miyoung, K., & Chiyoung, C. (2013). Cultural meaning of course evaluation among nursing students and faculties in Korea. *Nurse Education Today*, 639-643.
- Moss, J., & Hendry, G. (2002). Use of Electronic Surveys in Course Evaluation. *British Journal of Educational Technology*, 33(5), 583-592.
- Myers, M. D. (2009). *Qualitative research in business & management*. London: Sage Publications .
- Myers, M. D., & Avison, D. (2002). *Qualitative research in information systems: A reader*. London: Sage Publications.
- Nicole, M. H., Steven, R. L., & Erin, B. R. (2007). Web-Based Versus Paper-and-Pencil Course Evaluations. *Teaching of Psychology*, 11,, 259-261.

- Nikolaidis, Y., & Dimitriadis, S. (2014). On the student evaluation of university courses and faculty members. *European Journal of Operational Research* 238, 199 - 207.
- Orlikowski, W., & Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. . *Information Systems Research*, 2, 1–28.
- Ryan, G. W., & Bernard, H. R. (2003). Techniques to identify themes. *Field Methods*, 15(1), 85–109.
- Spencer, K. J., & Schmelkin, L. P. (2002). Student perspectives on teaching and its evaluation. *Assessment and evaluation in Higher Education*, 397-409.
- Swanson, D. J., & Creed, A. S. (2014). Sharpening the Focus of Force Field Analysis . *Journal of Change Management* , 28-47.
- Walsham, G. (1993). *Interpreting information systems in organizations*. Chichester: John Wiley and Sons.
- Walsham, G. (1995). nterpretive case studies in IS research: nature and method. *European Journal of Information Systems* (4), 74-81.
- Walsham, G. (2006). Doing interpretive research. *European Journal of Information Systems*, 320 -330.
- Weißenfels, S., Ebner, K., Ebner, K., & Smolnik, S. (2016). Does the IS Artifact Matter in Sociomateriality Research? A Literature Review of Empirical Studies. *49th Hawaii International Conference on System Sciences* (pp. 1997-2006). Hawaii: IEEE.
- Zanin-Yost, A., & Crow, R. (2012). From Traditional to Non-Traditional: An Adaptive Procedure for Assessing the Instruction Librarian. *The Reference Librarian* 53 (2), 206-218.

Online Interaction Quality Among Adult Learners: The Role of Sense of Belonging and Perceived Learning Benefits

Anh Nguyet DIEP

Vrije Universiteit Brussel

Celine COCQUYT

Vrije Universiteit Brussel

Chang ZHU

Vrije Universiteit Brussel

Tom VANWING

Vrije Universiteit Brussel

ABSTRACT

The present study employs social cognitive theory (SCT) and social capital as the guiding frameworks to explain online interaction quality among learners in a blended learning program ($N=179$). Capturing performance expectancy by perceived learning benefits and online interaction quality with nuanced cognitive measures, the study aims to validate how the SCT and social capital, which are mostly used in predicting online interaction quality in virtual settings, are applicable in an academic setting. More specifically, we investigate the relationship between trust, norms of reciprocity, sense of belonging, altruism, perceived learning benefits and learners' perception of online interaction quality. Data were collected quantitatively by means of a questionnaire. Confirmatory factor analysis (CFA) and path analysis were employed to validate the instrument and answer the research question respectively. The findings show that only sense of belonging and perceived learning benefits significantly account for a moderate variance in online interaction quality ($R^2 = .46$). Based on the findings, implications for instructional practice and further research are suggested.

Keywords: online interaction quality, social capital, perceived learning benefits, and adult learners

INTRODUCTION

Different instructional approaches such as scaffolding, prompting, and role assignments have been adopted by instructors in online and blended learning to enhance learners' participation in online discussions. Of equal importance, the quality of these online discussions is also a major concern. If high level of online participation is hard to achieve, high quality of online interaction is even more difficult to reach. There are different factors inhibiting adult learners from being active online, e.g. assuming different roles during the undertaking of the study or the preference of interacting with those of similar backgrounds (Yukselturk, 2010). Nevertheless, the decision to dedicate time and effort to online discussion of adults are normally weighted based on cost-benefits evaluation (Kollock, 1999). This means of learners are intrinsically and extrinsically motivated in their online participation, factors related to situational variables will be of less significance.

The quality of online interaction has been investigated in a number of settings. For example, Peltier, Schibrowsky, and Drago's study (2007) confirms that instructor's facilitation has a positive impact on learners' perception of online interaction quality. Additionally, Lee and Bonk (2016) found that the higher the degree of closeness learners perceived, the more they became involved in their online participation in blogs, thus contributing more to the community of learners. In virtual learning communities in which the sharing of knowledge is voluntary, Chang and Chuang (2011) and Chiu, Hsu, and Wang (2006) found that social capital, measured by trust, norms of reciprocity, and sense of belonging significantly predict the quality of knowledge sharing. The nature of virtual learning communities and the learning communities of adult learners share the essence that their members are more likely to contribute and advance the quality of online interactions when they are motivated and intrigued by factors other than obligation from the course requirement. Thus employing the social capital framework along with factors related to learners such as performance expectancy as an extrinsic motivational factor and altruism as an intrinsic motivational factor would provide more insights regarding enablers of online interaction quality. However, research findings up to date have revealed that such studies in formal education settings are still scarce. The results from studies in virtual learning communities as those carried out by Chang and Chuang (2011), Chiu et al. (2006) and Lampel and Bhalla (2007) cannot be generalized to adult education settings for a number of reasons. The first is that the quality of online interaction or knowledge sharing in these studies is that of being accurate, reliable, complete and understandable (Chiu et al., 2006). Thus when applied to educational setting, such measures of the quality of online interaction cannot comprehensively capture the cognitive essence required for academic knowledge development. Second, performance expectancy in virtual learning communities is conceptualized as reputation and community building (Chang & Chuang, 2011; Chiu et al., 2006). These outcome expectations are not applicable in formal education settings as adult learners may not have that motivation of enhancing individual status and expanding social connections with peers given that they have other options in addition to online interaction opportunities.

Against these backgrounds, the present study aims to bridge the gap in literature by investigating how social capital and factors related to learners' motivation such as altruism and performance expectancy measured by perceived learning benefits are associated with online interaction quality. Conducted in the context of formal education setting that employs blended learning as mode of instructions, the present study aims to unravel critical factors contributing to the quality of online interaction among a group of adult learners who are heterogeneous in their socio-demographic background. More specifically the following research question is addressed: What are the relationships between social capital and learners' personal-related factors, namely, altruism and perceived learning benefits and online interaction quality? In addition, we also examine if these relationships are moderated by learners' socio-demographics, including age, gender, educational attainment, and employment status.

THEORETICAL BACKGROUND

The quality of online discussion or knowledge sharing by members in a learning community is affected by various factors. Hsu, Lu, Yen and Chang (2007) argue that the extent to which individuals contribute to the learning community is contingent on their personal motivation and the social environment, of which they are a member. Researchers have based largely on the Socio Cognitive Theory (Bandura, 1989) to explain the behaviors of knowledge sharing in an online learning community, e.g. Chiu et al. (2006). The Social Cognitive Theory states that a person's behavior is influenced by the social networks and their cognition, e.g. expectations including outcome expectations and self-efficacy (Bandura, 1989). Previous studies have included social capital as aspects of the social networks and performance expectancy and altruism as those of personal cognition in explaining the quality of online interaction among learners (e.g. Tamjidyamcholo, Baba, Tamjid & Gholipour, 2013). Self-efficacy, being one of the factor in the SCT, is not included in most studies, e.g. Hsu et al. (2006) for the reason that self-efficacy is context-specific and hence is subject to change over time (Chen, Gully, & Eden, 2001). Thus in the following section, factors related to the social environment, namely social capital and personal cognition including performance expectancy and altruism that are hypothesized to be associated with online interaction quality are discussed.

Online interaction quality

Due to the fact that the context in previous studies is different from academic settings, the online interaction quality is measured by the quality of information shared rather than the cognitive aspects related to knowledge construction such as triggering self-reflection and knowledge transfer. Taking this into account, the present study adopts the cognitive presence scale from Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, and Swan (2008) to capture the online interaction quality among the adult learners in a blended learning program. We define online interaction quality as an evaluation of how the learners perceive the interaction with other learners help them to build up their knowledge related to the courses and facilitate knowledge transfer.

Social capital

According to Putnam (2000), social capital refers to the networks, norms, and social trust that foster the collective processes and actions of members within a community for the public good. From a different standpoint, Bourdieu (1986) and Coleman (1988) (cited in Zhang & Kaufman, 2015) address social capital as the social networks and resources obtained by individuals through their memberships and interactions within the community. Bourdieu and Coleman's conceptualization of social capital implies that individuals can benefit from the community of their membership whereas Putnam proposes that the community can benefit from the social capital generated through the interactions among its members (Oztok, Zingaro, Makos, Brett, & Hewitt, 2015; Zhang & Kaufman, 2015). Despite different emphasis, these authors share the idea that social capital results from the dynamic interaction among members and an increase in social capital is beneficial for individuals and the community (Oztok et al., 2015).

When investigating the role that social capital plays in enhancing the quality of online interaction among learners, we view the concept from Putnam's perspective. This means that the trust, sense of belonging, and norms of reciprocity among the classmates are hypothesized to motivate them to actively contribute to the online discussions for leveraging the quality of one another's learning. In this study, we adopt the definition of trust, norms of reciprocity, and sense of belonging from Chang and Chuang (2011) to conceptualize and operationalize social capital. Accordingly, trust is defined as "individual beliefs and expectations that other participants can perform consistent behaviors to follow norms and principles of a virtual community" (Chang & Chuang, p.12). The authors refer to norms of reciprocity as the perception of fairness to mutually share knowledge to each other in a virtual community and sense of belonging as feeling of belonging to a group or a set of people. These three constituents of social capital have been confirmed as significant factors relative to online interaction quality in virtual communities in Chang and Chuang (2011), Chiu et al. (2006), and Tamjidyamcholo et al. (2013).

Altruism and performance expectancy

Altruism is defined as the offer to help others by voluntarily sharing knowledge without an expectation of a return from the recipients (Kollock, 1999; Steward & Gossain, 2006; Yu & Chu, 2007). According to Hung, Durcikova, Lai, and Lin (2011), altruism is considered a type of intrinsic motivation that triggers one's knowledge sharing to the community. However the authors found a non-significant effect of altruism on the quality of knowledge shared, which is in line with the findings from Lampel and Bhalla (2007) and contradictory to the results from Chang and Chuang (2011). In this regard, it is relevant to take Kollock's (1999) opinion into account, who postulates that altruism may compete with extrinsic motivation such as the evaluation of the gain that can be obtained. In fact, Hsu et al. (2006) and Hung et al. (2011) found that extrinsic motivation such as reputation is stronger than altruism in predicting the quality of online interaction in a community. In an educational setting, research validating the role of altruism as a measure of intrinsic motivation and performance expectancy as extrinsic motivation concerning online interaction quality is not yet recognized. In addition, performance expectancy in existent studies mainly focuses on reputation, community development, and network expansion. These outcomes are not highly relevant in educational settings because the most important motivation and goals of one's participation in online discussions related to the courses under question is the perception of how the community can help them to build and expand their knowledge repertoire.

Therefore, this study addresses these two gaps by using perceived learning benefits of a measure of performance expectancy. The construct is adopted from Xie and Ke (2011) to capture the perceptions of learners as to how the learners evaluate the value of online discussion relative to their learning.

Based on these theoretical backgrounds, we hypothesize that social capital measured by trust, norms of reciprocity, and sense of belonging and learners' intrinsic and extrinsic motivation measured by altruism and perceived learning benefits respectively, will have a positive relationships with the quality of online interaction as perceived by the learners.

METHODOLOGY

Research design

The present study employed a quantitative approach to data collection by means of a questionnaire. Data were collected one time in different centers for adult education in Flanders (Belgium). Thus in terms of design, the study is cross-sectional in nature. The questionnaire was distributed both online on the researchers' institutional platform or in the participants' classrooms with the presence of their instructors and one of the research members. To minimize issues related to common method bias, the participants were encouraged to give answers most relevant to them and therefore, no right or wrong answers were the case. The participation in the study was totally voluntary, i.e. no incentives were given and the anonymity of the participants was guaranteed.

Participants

The participants in this study are learners who were following the Specific Teacher Training program. The program employed blended learning as an instructional strategy. Learners who have successfully completed the program are granted with a certification to be qualified for teaching at secondary levels. After screening for incomplete and unengaged answers, one hundred and seventy nine questionnaires were retained for analyses. The number of female learners (61.5%) is nearly twice as much as male learners (38.5%). Higher secondary degree holders (57.5), constitute the majority, followed by higher education degree holders (39.1%) and lower secondary degree holders (3.4%). As for employment, learners who have a fulltime job is the biggest group (62.6%). Those who are part-timers accounts for 20.7% and those who are full-time enrolled 10.6%. Learners aged between 18-30 accounts for half of the sample, followed by those aged between 31-40 (32.4%) and 41-50 (17.3%). The average age of the participants is $M=32.08$, $SD=7.82$.

Instrument

The present study used existing scales validated from previous studies. As for the independent variables, social capital including three dimensions, i.e. trust, norms of reciprocity, and sense of belonging, and altruism were adopted from Chang and Chuang (2011) and Chiu et al. (2006). Perceived learning benefits measuring how the learners perceived that online interactions with peers contribute to their understanding of the course were adapted from Xie and Ke (2011). Regarding the dependent variable quality of knowledge sharing, we have opted to modify the cognitive presence scale from Arbaugh et al. (2008) because the scale is more nuanced and applicable for capturing the cognitive quality of online interaction among a community of adult learners rather than a professional learning community as in Chang and Chuang (2011) and Chiu et al. (2006). In total, there are 32 items included in the questionnaire. After the scales have been decided upon, face validity had been verified by three experts in the fields of adult learning and social capital before they were translated into Dutch, which is the mother tongue of the participants. When there were discrepancies in the translation, a third Dutch-native colleague was consulted to ensure the clarity of the items' meaning into without losing the essence of the items in English.

Data analysis method

To answer the research questions, we applied Partial Least Square-Structural Equation Modeling (PLS-SEM) as method of data analysis. Accordingly, the analyses consisted of two phases. First the measurement model was validated by confirmatory factor analysis (CFA). At this step, construct validity was evaluated by two rules of thumbs suggested by Fornell and Larcker (1981) and Chin (1998) such that the average variance extracted (AVE) for each construct should be equal or greater than .50 and the square root of the AVE of each construct should be greater than the correlations of this specific with others. The second step in PLS-SEM was to confirm the hypotheses by means of path analyses. All these two steps were conducted by employing SmartPLS 2.0 M3 (Ringle, Wende, & Will (2005).

RESULTS

Measurement Validation

Confirmatory factor analysis shows that all items have adequate factor loadings (>.400) onto to their respective constructs. Thus no items have been removed. Table 1 presents the mean, standard deviations, the AVEs, composite reliability, and Cronbach's alpha.

Table 1: The mean, standard deviations, average variance extracted (AVEs), composite reliability, and Cronbach's alpha of the constructs

Constructs	<i>M (SD)</i>	AVEs	Composite reliability	Cronbach's Alpha
Trust	3.61 (0.56)	.57	.87	.82
Norms of reciprocity	3.78 (0.76)	.85	.92	.82
Sense of belonging	3.51 (0.72)	.76	.93	.90
Altruism	4.17 (0.63)	.84	.94	.90
Perceived learning benefits	3.33 (0.70)	.67	.91	.88
Online interaction quality	2.92 (0.91)	.68	.96	.96

As for divergent validity, the square root of AVE of each construct displays greater value than the correlations between the constructs themselves. This reveals that multi-collinearity is not a concern in this sample. Table 2 presents the AVEs and the correlations among the constructs.

Table 2: The correlations among the constructs with their respective AVEs (in bold)

Constructs	OIQ	AL	PLB	NP	SB	T
OIQ	.82					
AL	0.114	.92				
PLB	0.619	0.235	.82			
NP	0.293	0.554	0.275	.92		
SB	0.417	0.469	0.362	0.586	.87	
T	0.237	0.360	0.125	0.526	0.572	.75

Notes for abbreviations: Online interaction quality (OIQ), altruism (AL), perceived learning benefits (PLB), norms of reciprocity (NP), sense of belonging (SB), and trust (T).

The structural model

As the measurement model has been confirmed, path analyses were followed to identify the significant predictors of online interaction quality. According to the results presented in Table 3, perceived learning benefits were the most significant factor ($\beta=.55, p<.001$). However, altruism did not significantly predict online interaction quality ($\beta=-.18, p>.05$), which means extrinsic motivation has outweighed intrinsic motivation. Among the three constructs of social capital, only sense of belonging was found as the significant factor ($\beta=.23, p<.05$). Altogether, the significant predictors account for a variance of 46% in online interaction quality, which shows a medium effect according to Hair, Ringle, & Sarstedt (2011).

Table 3: Result from path analysis for the outcome variable online interaction quality ($R^2 = .46$)

Independent Constructs	Standardized coefficients	t-statistics
Trust	.08	.86
Norms of reciprocity	.07	.64
Sense of belonging	.23	1.97*
Altruism	-.18	1.79
Perceived learning benefits	.55	7.22***

Notes: * $p<.05$, ** $p<.001$

Analyses of variance

Analyses of variance, including ANOVAs and *t*-tests were used to examine if socio-demographic variables may affect the relationship among the variables.

- (1) T-test result showed that there was no significant difference between male and female learners regarding perception of online interaction quality, $t(177) = 0.277, p = .785$.
- (2) The results from ANOVA reveal that there was no statistical differences among the three age groups of learners as for perception of online interaction quality, $F(2) = 0.067, p = .935$. However, a significant difference was found among learners who have different educational attainment, $F(2)=4.692, p = .01$ and employment statuses, $F(2) = 3.362, p = .037$. Post-hoc analyses further revealed that learners who hold a higher education degree ($M = 2.67, SD = 0.04$) had significant lower mean scores than higher-secondary degree holders ($M= 3.09, SD = 0.84$). In addition, learners who were a part-timer scored higher ($M = 3.16, SD = 0.85$) than learners who were fulltime enrolled ($M = 2.5, SD = 0.91$).

As educational attainment and employment status can moderate the relationships between the independent variables, namely altruism, perceived learning benefits, trust, norms of reciprocity, and sense of belonging and online interaction quality, we conducted multi-group moderation to validate the model. Following Keil, Saarinen, Tan, Tuunainen, Wassenaar, and Wei's (2000) approach, the model parameters or regression coefficients and standard errors (*SE*) of each path were estimated for each group. Subsequently, *t*-statistics were applied to find out if the effects of the five independent variables were significantly different as a function as group differences. However, all *t*-statistics were non-significant indicating that educational attainment and employment status were not significant as moderators. The results of multi-group moderation analyses are presented in Table 4.

Table 4: Results of multi-group moderation for educational attainment and employment status

Latent variables	Higher secondary degree holders (<i>n</i> =103)		Higher education degree holders (<i>n</i> =70)		<i>t</i> -statistics	<i>p</i> -values (2-tailed)
	Regression coefficients	<i>SE</i>	Regression coefficients	<i>SE</i>		
Altruism	-0.07	0.11	-0.28	0.12	1.27	0.21
Perceived learning benefits	0.51	0.08	0.61	0.07	0.88	0.38
Trust	-0.03	0.14	0.15	0.09	0.96	0.34
Norms of reciprocity	0.15	0.11	0.02	0.10	0.83	0.41
Sense of belonging	0.19	0.12	0.10	0.11	0.57	0.57
Latent variables	Part-time learners (<i>n</i> =37)		Fully-enrolled learners (<i>n</i> =19)		<i>t</i> -statistics	<i>p</i> -values (2-tailed)
	Regression coefficients	<i>SE</i>	Regression coefficients	<i>SE</i>		
Altruism	-0.25	0.13	-0.14	0.11	0.59	0.56
Perceived learning benefits	0.54	0.06	0.41	0.08	1.28	0.21
Trust	0.17	0.15	0.16	0.19	0.06	0.95
Norms of reciprocity	0.34	0.12	0.07	0.16	1.32	0.19
Sense of belonging	0.22	0.19	0.36	0.16	0.48	0.64

DISCUSSION AND CONCLUSION

Based on SCT (Bandura, 1989) and social capital theory (2000), the present study investigates the relationships between social capital, personal related factors, i.e. altruism and perceived learning benefits, and online interaction quality. The study has operationalized perceived learning benefits and online interaction quality in such a way that is more relevant to a community of adult learners following a formal education program. Multigroup moderation was also conducted to examine the moderating effects of socio-demographic factor. Yet, non-significant moderation was found.

Although outcome expectancy in this study was captured by perceived learning benefits to be more relevant in education settings, its positive relationship with online interaction quality is in line with previous studies (Chang & Chuang, 2011; Chiu et al, 2006). However, altruism as a measure of learners' intrinsic motivation failed to predict online interaction quality, which is also found in Hung et al. (2011) and Lampel and Bhalla (2007). This finding highlights that in virtual learning communities, intrinsic motivation manifest in altruism is more important to explain the quality of interaction because the sustainability of the communities highly depend on the voluntariness of each member. In educational settings, altruism may lack its prevalence because the need to sustain the online interactions among the learners may not be the responsibility of the learners but the instructors instead. Given this lack of need, the learners may rely on their evaluation of performance expectancy, namely perceived learning benefits as the sole motivation for their quality contribution. In addition, as most learners in this sample are employed fulltime and part-time, the evaluation of cost benefits has outweighed altruism. Thus to successfully enhance the quality of online interaction, it is suggested that the instructors can explicitly clarify how online interactions with peers are aligned with the learning objectives. In so doing, the learners will be more motivated to substantially contribute to online discussions and overcome barriers such as the lack of time due to other obligations.

Contradictory to most studies that employ the social capital framework to explain online interaction quality, only sense of belonging was positively correlated with the dependent variable. That trust and norms of reciprocity were found to be non-significant suggest that learners in a program may have known each other and consider that helping each other in need is a normal practice. Then there is not that high variability in terms of trust and norms of reciprocity among learners in a program whose identities are more visible than those in virtual learning communities as investigated by Hsu et al. (2007).

Being found as a significant predictor, sense of belonging has demonstrated that it is the most significant element of social capital in online learning environment as initially postulated by Rovai (2002). Thus, an online learning environment in which learners feel that they share a common goal, e.g. enhancing knowledge on a particular topic or tackling an educational issue, and that they are highly welcomed to present their voices is desired to bring about high quality of online interaction. To achieve this goal, again the instructors' strategies in creating opportunities for the sharing of personal background and lived experiences among learners as suggested by Nistor, Daxecker, Stanciu, and Diekamp (2015) is recommended. Additionally, effort to build up common goals and missions related to the professional career such as an educator identity as in this study, should also be invested as this helps the learners feel more connected to one another and chances are that they will be more active in their online contributions.

There are some limitations that make the generalization to be taken with caution. First, although self-report questionnaires can be the most appropriate method to capture relative concepts such as trust, sense of belonging and perceived learning benefits, it is recognized that the quality of online interaction can be better measured by objective methods such as message coding. Therefore, future research with more objective measures of online interaction will help to further validate the findings. The translation of the questionnaire is also one factor that needs to be taken into account. More specifically, we suggest validating the questionnaire in an English-speaking sample to confirm the reliability and validity of the measurement model. Third, that the participants in this sample were adult learners following a common program, namely Specific Teacher Education, may limit the interpretations of the results in hard disciplines such as Computer Science. For example, Neumann, Parry, and Becher (2002) postulate that learners in different disciplines may have different epistemological beliefs and learning approaches with soft-disciplined faculty being more subscribed to reflective discussions as method of knowledge construction. Therefore, we suggest that a comparative study using disciplines as a moderator can be more helpful to gain more insights into the critical enablers of online interaction quality.

In conclusion, in an adult educational context, the present study has revealed that the SCT and social capital theories can be relevant to explain the quality of knowledge sharing among learners in a blended learning program. The two critical elements that have been identified are perceived learning benefits and sense of belonging, which help to explain a moderate variance in learners' perception of online interaction quality. Based on these findings, implications for instructional practices have also been proposed. In essence, making learning goals explicit, underlying how online interaction is important to one's learning, and creating a mutually respectful environment with shared goals and identity are of significance to enhance the quality of online interaction among learners.

REFERENCES

- Arbaugh, J. B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., Richardson, J. C., & Swan, K. P. (2008). Developing a community of inquiry instrument: Testing a measure of the community of inquiry framework using a multi-institutional sample. *The Internet and higher education*, 11(3), 133-136.
- Bandura, A. (1989). Human agency in social cognitive theory. *American psychologist*, 44(9), 1175.
- Chang, K. C., Wong, J. H., Li, Y., Lin, Y. C., & Chen, H. G. (2011). External social capital and information systems development team flexibility. *Information and Software Technology*, 53(6), 592-600.
- Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational research methods*, 4(1), 62-83.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, 295(2), 295-336.
- Chiu, C. M., Hsu, M. H., & Wang, E. T. (2006). Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision support systems*, 42(3), 1872-1888.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research (JMR)*, 18(1), 382-388.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, 19(2), 139-152.

- Hsu, M. H., Ju, T. L., Yen, C. H., & Chang, C. M. (2007). Knowledge sharing behavior in virtual communities: The relationship between trust, self-efficacy, and outcome expectations. *International journal of human-computer studies*, 65(2), 153-169.
- Hung, S. Y., Durcikova, A., Lai, H. M., & Lin, W. M. (2011). The influence of intrinsic and extrinsic motivation on individuals' knowledge sharing behavior. *International Journal of Human-Computer Studies*, 69(6), 415-427.
- Keil, M., Saarinen, T., Tan, B. C., Tuunainen, V., Wassenaar, A., & Wei, K. K. (2000). A cross-cultural study on escalation of commitment behavior in software projects. *Management Information Systems Quarterly*, 24(2), 299-325.
- Kollock, P. (1999). The economies of online cooperation. *Communities in cyberspace*, 220.
- Lampel, J., & Bhalla, A. (2007). The role of status seeking in online communities: Giving the gift of experience. *Journal of Computer-Mediated Communication*, 12(2), 434-455.
- Lee, J., & Bonk, C. J. (2016). Social network analysis of peer relationships and online interactions in a blended class using blogs. *The Internet and Higher Education*, 28, 35-44.
- Neumann, R., Parry, S., & Becher, T. (2002). Teaching and learning in their disciplinary contexts: A conceptual analysis. *Studies in higher education*, 27(4), 405-417.
- Nistor, N., Daxecker, I., Stanciu, D., & Diekamp, O. (2015). Sense of community in academic communities of practice: predictors and effects. *Higher Education*, 69(2), 257-273.
- Oztok, M., Zingaro, D., Makos, A., Brett, C., & Hewitt, J. (2015). Capitalizing on social presence: The relationship between social capital and social presence. *The Internet and Higher Education*, 26, 19-24.
- Peltier, J. W., Schibrowsky, J. A., & Drago, W. (2007). The interdependence of the factors influencing the perceived quality of the online learning experience: A causal model. *Journal of Marketing Education*, 29(2), 140-153.
- Putnam, R. D. (2000). Bowling alone: America's declining social capital. In *Culture and Politics* (pp. 223-234). Palgrave Macmillan US.
- Ringle, C. M., Wende, S., & Will, S. (2005). *SmartPLS 2.0 (M3) Beta*.
- Rovai, A. P. (2002). Building sense of community at a distance. *The International Review of Research in Open and Distributed Learning*, 3(1).
- Stewart, K. J., & Gosain, S. (2006). The impact of ideology on effectiveness in open source software development teams. *Mis Quarterly*, 291-314.
- Tamjidyamcholo, A., Baba, M. S. B., Tamjid, H., & Gholipour, R. (2013). Information security–Professional perceptions of knowledge-sharing intention under self-efficacy, trust, reciprocity, and shared-language. *Computers & Education*, 68, 223-232.
- Xie, K., & Ke, F. (2011). The role of students' motivation in peer-moderated asynchronous online discussions. *British Journal of Educational Technology*, 42(6), 916-930.
- Yu, C. P., & Chu, T. H. (2007). Exploring knowledge contribution from an OCB perspective. *Information & Management*, 44(3), 321-331.
- Yukselturk, E. (2010). An investigation of factors affecting student participation level in an online discussion forum. *TOJET: The Turkish Online Journal of Educational Technology*, 9(2).
- Zhang, F., & Kaufman, D. (2015). The impacts of social interactions in MMORPGs on older adults' social capital. *Computers in Human Behavior*, 51, 495-503.

Open Source Software for Analysis and Correlation of Reading Patterns with Superior Sat Scores Using Gaze-Tracking Device

Andrew HOWE

The American School in Japan

Japan

19howea@asij.ac.jp

Phong NGUYEN

Tokyo Academics

Japan

phong@tokyoacademics.com

ABSTRACT

An open-source application using a gaze-tracking device for investigating a correlation between reading patterns and superior Scholastic Aptitude Test (SAT) reading scores is presented. An eye-gaze tracking device tracks where the reader is looking across the screen and provides the coordinates of the gaze. The collected data enables us to determine reading patterns and times spent looking at specific sections of the screen and analyze them. The statistical analysis shows that the ratio of time spent on reading the passage and time spent on reading the questions has the highest correlation with number of correct answers. The software is released under the GNU General Public License and is freely available for all educators.

INTRODUCTION

The SAT is a standardized test that many American students choose to take in order to enroll in University. Students want to know what methods are the most effective in order to achieve their highest potential score. Previous analysis of the SAT's reading section has been through post-test surveys, which are highly subjective and depend completely on the students' biased answers [1]. A more objective analysis of SAT reading sections should be conducted in order to provide students with the most reliable techniques for reading various passages.

Eye gaze tracking technology has been developed recently and made readily available to average consumer. The device tracks the eye gaze with a camera and high-resolution infrared sensor. The data collection method is very simple, nonintrusive, and objective. By using this non-intrusive method we were able to collect data but still have the test-taking scenario as accurate as possible. Fig. 1 shows the demonstration of the technology.

Our method uses an eye-gaze tracking device in order to collect and store data on reading patterns when students are taking the SAT reading test. Unbiased data collected from the eye-tracking device allows us to analyze and find different reading patterns. Correlation analysis between reading patterns and raw scores can uncover the most effective and efficient way to read a SAT reading passage. Our findings reveal that some reading patterns (e.g. ratio of time spent on reading questions and the ratio of time spent on reading the passage) have a significant impact on SAT scores while other patterns (e.g. total amount of switches between the passage and the questions) have little to no impact on performance for the SAT reading section. Our application is open-source and is available to all educators who are interested in a more objective SAT analysis. The source code is available on Github: <https://github.com/19howea/EyeTribeDataCollection.git>.

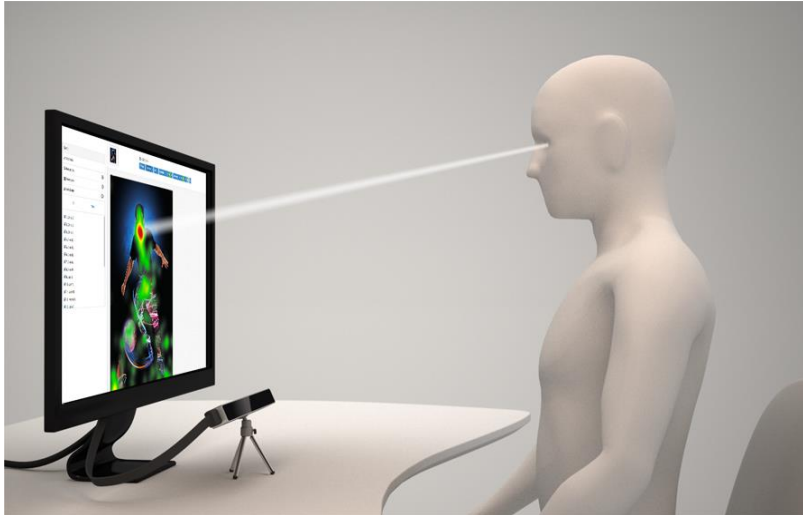


Fig 1. Eye gaze tracking technology [3]

RELATED WORK

Traditionally the way College Board would collect data about the test is through biased and qualitative post test surveys. This has created a very unreliable and hard to analyze data set. Prior to our research there was no unbiased, nonintrusive and statistical method to evaluate reading patterns on a SAT. Our method aims to give students a more comprehensive and detailed way to better improve their test scores. Moreover, our open-source code gives teachers around the world with varying backgrounds a chance to analyze his or her students relative to their experience.

PROPOSED METHOD

For our research we used an EyeTribe eye-tracking device in order to detect gaze patterns from the test subjects. The biggest screen an EyeTribe eye-tracker can accurately work on is a 24inch monitor. Our code is optimized for a 24inch monitor because with the biggest screen the points of where the subject is looking on the screen can be as clear as possible.

Data Collection Method

To collect our data we use Khan Academy's practice SAT reading passages as the environment [4], where the passage is on the left side and the questions are on the right side. Students are required to take the test online while the Eye-Tribe device is tracking their eyes. The coordinates of where the students are looking are stored in a CSV file for us to analyze. With the 24inch monitor, the coordinate goes from (0,0) to (600,1024). The Eye-Tribe device is capable of recording 30 coordinates in a second. Figure two shows the visualization of a test takers eye gaze on the Khan Academy interface.

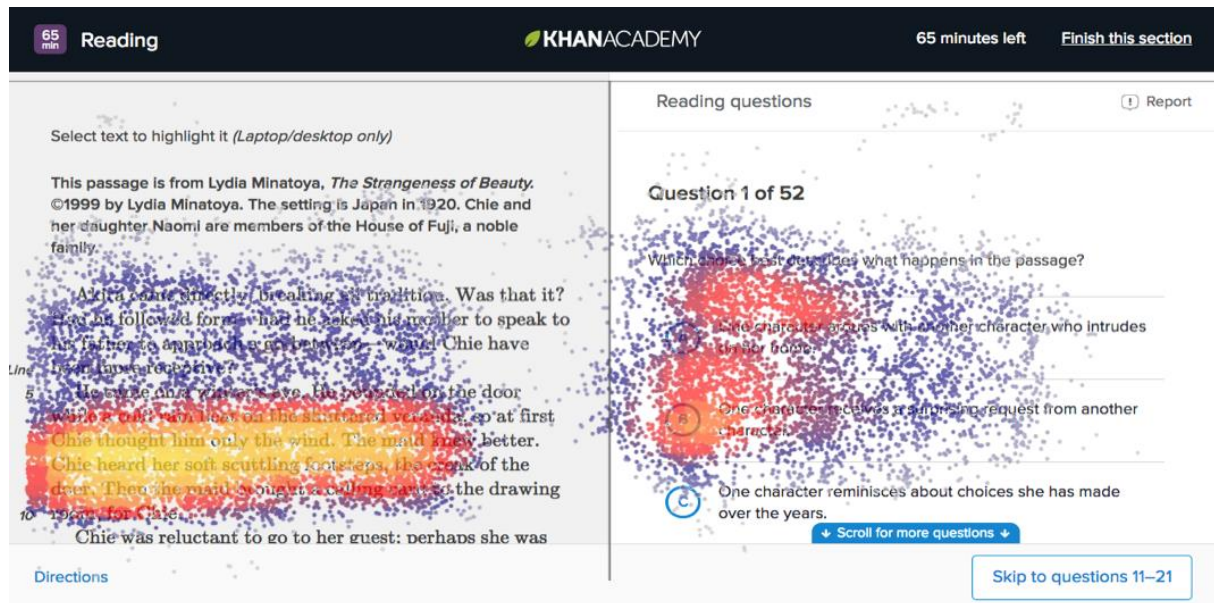


Fig 2. Heat map of eye gazes on Khan Academy's SAT passage test interface

In addition, we take note of number of correct answers, incorrect answers, unanswered questions, and other various features of the test subjects like ethnicity, gender, age, etc. Table 1. shows an example of our ground truth data which will be used for our statistical models.

Table 1. Example of ground truth data

Last_Name	First_Name	Age	Grade	Gender	Nationality	Date_of_Experiment	Time_of_Exp	This passage	Correct_Answ	Incorrect_An	No_Answer	Total_Questi	Bad_Data
		15	10th	Male	USA/Japan	20170430	143937	This passage	7	3	0	10	FALSE
		15	10th	Male	USA/Japan	20170430	150317	This passage	8	2	0	10	FALSE
		15	10th	Male	USA/Japan	20170430	152308	This passage	7	3	0	10	FALSE
		17	11th	Female	India	20170503	182049	This passage	7	3	0	10	FALSE
		17	11th	Female	India	20170503	184936	This passage	9	1	0	10	FALSE
		17	11th	Female	India	20170503	190715	This passage	8	2	0	10	FALSE
		16	11th	Male	USA	20170503	193919	This passage	9	1	0	10	FALSE
		16	11th	Male	USA	20170503	195308	This passage	8	2	0	10	FALSE
		16	11th	Male	USA	20170503	201347	This passage	10	0	0	10	FALSE
		15	10th	Male	Australian/Ja	20170509	185826	This passage	9	1	0	10	FALSE
		15	10th	Male	Australian/Ja	20170509	192957	This passage	9	1	0	10	FALSE
		15	10th	Male	Australian/Ja	20170509	194208	This passage	10	0	0	10	FALSE
		17	12th	Male	China	20170702	173821	This passage	10	0	0	10	FALSE
		17	12th	Male	China	20170702	175936	This passage	7	3	0	10	FALSE
		17	12th	Male	China	20170702	181520	This passage	6	4	0	10	FALSE
		17	12th	Male	USA/China	20170703	174023	This passage	10	0	0	10	FALSE
		17	12th	Male	USA/China	20170703	175737	This passage	8	2	0	10	FALSE
		17	12th	Male	USA/China	20170703	181509	This passage	8	2	0	10	FALSE
		16	11th	Fermale	USA/China	20170703	183150	This passage	9	1	0	10	FALSE
		16	11th	Fermale	USA/China	20170703	184526	This passage	8	2	0	10	FALSE
		16	11th	Fermale	USA/China	20170703	185926	This passage	7	3	0	10	FALSE
		15	10th	Fermale	USA	20170705	184206	This passage	10	0	0	10	FALSE
		15	10th	Fermale	USA	20170705	190210	This passage	7	3	0	10	FALSE
		15	10th	Fermale	USA	20170705	192711	This passage	9	1	0	10	FALSE
		16	10th	Male	USA/Philippin	20170710	233302	This passage	7	3	0	10	FALSE
		16	10th	Male	USA/Philippin	20170710	234730	This passage	9	1	0	10	FALSE
		16	10th	Male	USA/Philippin	20170711	101649	This passage	8	2	0	10	FALSE
		15	10th	Male	China	20170717	202514	This passage	7	3	0	10	FALSE
		15	10th	Male	China	20170718	112200	This passage	9	1	0	10	FALSE
		15	10th	Male	China	20170718	113332	This passage	8	2	0	10	FALSE
		17	11th	Male	USA/Japan	20170517	175032	This passage	9	1	0	10	FALSE
		17	11th	Male	USA/Japan	20170719	103354	This passage	6	4	0	10	FALSE
		17	11th	Male	USA/Japan	20170719	104922	This passage	7	3	0	10	FALSE
		17	11th	Female	USA/Philippin	20170519	180053	This passage	10	0	0	10	FALSE
		17	11th	Female	USA/Philippin	20170721	122916	This passage	8	2	0	10	FALSE
		17	11th	Female	USA/Philippin	20170721	124709	This passage	10	0	0	10	FALSE

Analysis method

From the collected data, we extract 12 reading pattern features in order to then compare them with the number of questions answered correctly. The list of features and their explanation is presented in Table 2.

Table 2. List of features and their explanation

No.	Feature	Explanation
1	Total Time	Total time to complete one passage

2	Percentage of total time looking at the passage	Percentage of total time looking specifically at the passage
3	Percentage of total time looking at the questions	Percentage of total time looking specifically at the questions
4	Total amount of times the subject switches from looking at the passage to looking at the questions or vice versa	Total amount of times the test taker switches from looking at the passage half to the questions half or vice versa
5	Time spent solely on reading the passage at the beginning	Amount of time spent solely on reading the passage at the beginning of the test
6	Amount of ten second intervals spent solely on reading the passage	Amount of ten second intervals which have 80% or more of the ten seconds spent on reading the passage
7	Amount of ten second intervals spent solely on reading the questions	Amount of ten second intervals which have 80% or more of the ten seconds spent on questions the passage
8	Percentage of first four minutes spent only on reading the passage	Percentage of first four minutes spent only on reading the passage
9	Percentage of first four minutes spent only on reading the question	Percentage of first four minutes spent only on reading the question
10	Percentage of last four minutes spent only on reading the passage	Percentage of last four minutes spent only on reading the passage
11	Percentage of last four minutes spent only on reading the questions	Percentage of last four minutes spent only on reading the questions
12	Speed of reading the passage	The speed at which the test taker reads the passage

After extracting the 12 features, we then calculate the correlation of each above feature with the number of correct answer in order to find which features have the biggest impact. The correlation coefficient is ranges from -1 to 1. The closer the correlation coefficient gets to 1 or -1 the stronger the correlation between said feature and the number of correct answers is. We want to find which features have the most impact to see how we can maximize potential SAT reading passage scores. The correlation coefficient between features and number of correct answers is calculated by Pearson correlation formula [2].

$$r = \frac{1}{n-1} \sum \left(\frac{x-\bar{x}}{S_x} \right) \left(\frac{y-\bar{y}}{S_y} \right) \quad (1)$$

- r is the correlation coefficient
- n is total number of data
- x is the feature vector, \bar{x} is the average of x
- y is the correct answers vector, \bar{y} is the average of y
- S_x is the summation of x
- S_y is the summation of y

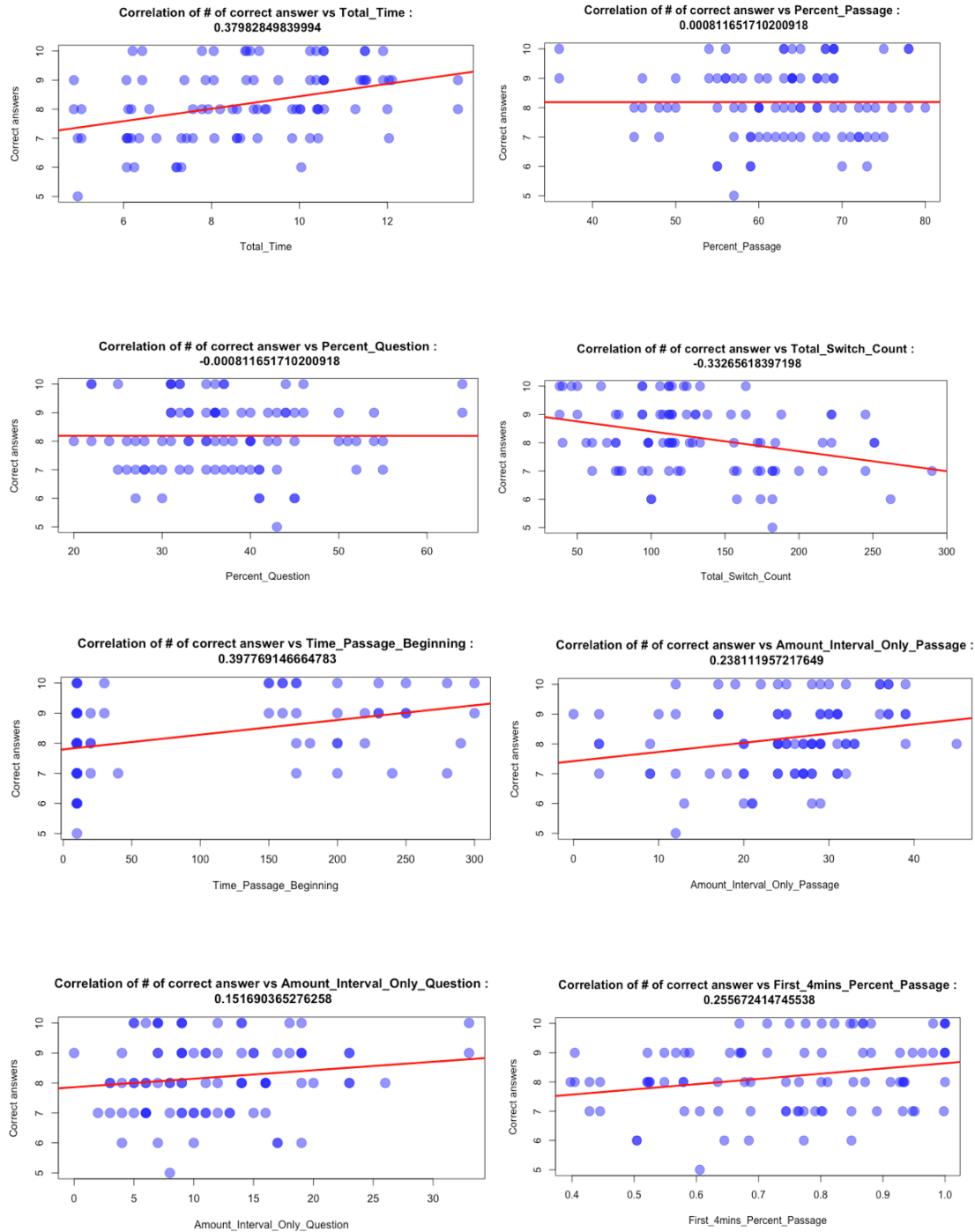
EXPIREMENT SETINGS

We chose high school students ranging from 14 years old to 18 years old as our experimenters because they are the main targets of this analysis. They were asked to read a passage and answer the questions with no restrictions. After we collected out sample set we decided to have each participant take the test two different ways: reading the passage then the questions and reading the questions then the passage.

We have collected data from 33 students coming from 10 different countries. In total, we have collected over 1000 minutes raw reading pattern data. Their performances were also recorded as we have explained above and in the example in Table 1.

RESULTS

We found that if a student spends more time reading questions then reading the passage, the performance was better (Fig. 3); however, if a student switch a lot between reading passage and reading questions, it does not improve his performance. Currently, a lot of data is skewed because of a small data set but we are working on collecting more to have the most accurate results for what features matter most.



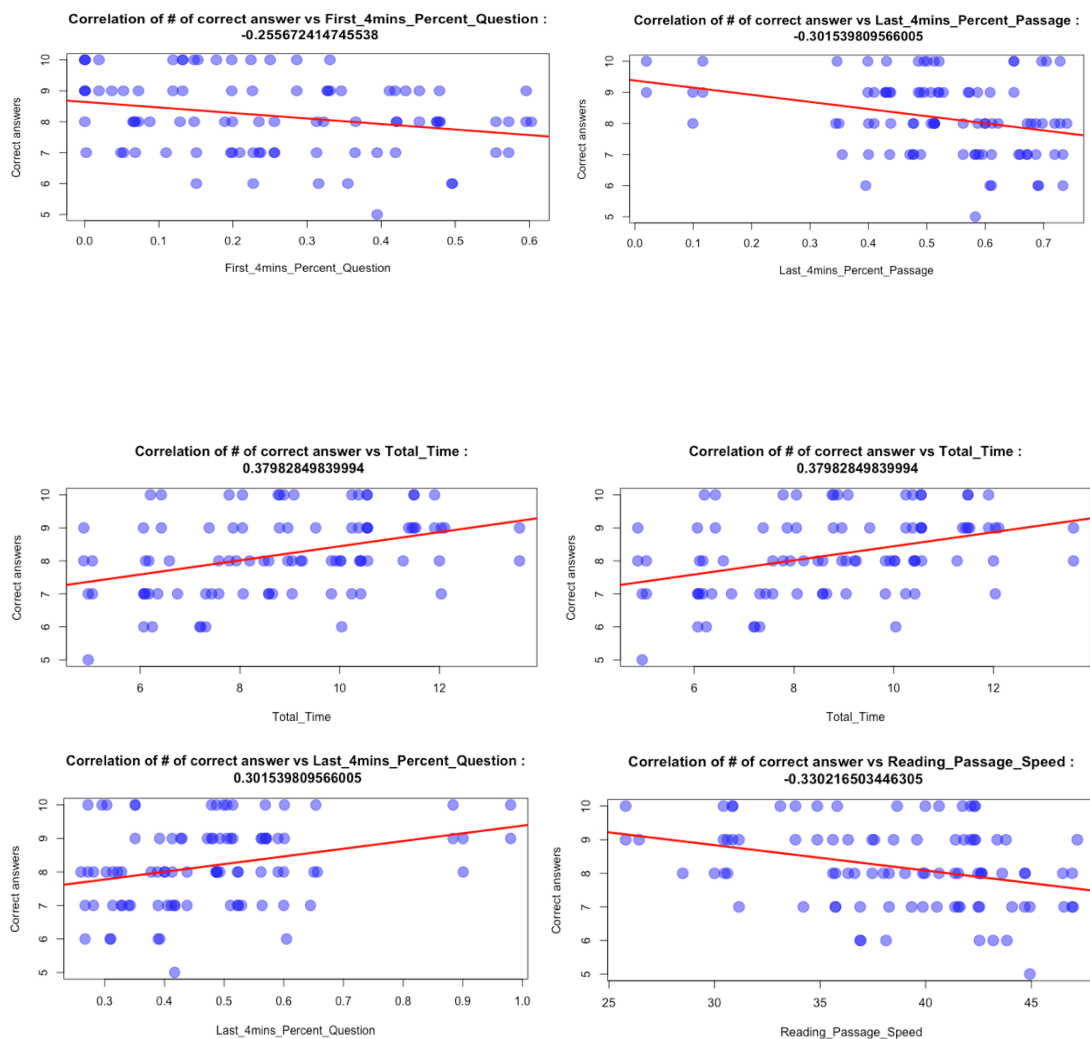


Fig 3. Graphs of correlation against the 12 features

The correlation coefficients of all features and the correct answers are listed in Table 3.

Table 3. Correlation coefficient between a reading pattern feature and number of correct answer

No.	Feature	Correlation Coefficient
1	Total Time	0.3798
2	Percentage of total time looking at the passage	0.0008
3	Percentage of total time looking at the questions	-0.0008
4	Total amount of times the subject switches from looking at the passage to looking at the questions or vice versa	-0.3327
5	Time spent solely on reading the passage at the beginning	0.3978
6	Amount of ten second intervals spent solely on reading the passage	0.2381
7	Amount of ten second intervals spent solely on reading the questions	0.1517
8	Percentage of first four minutes spent only on reading the passage	0.2557
9	Percentage of first four minutes spent only on reading the question	-0.2557
10	Percentage of last four minutes spent only on reading the passage	-0.3015
11	Percentage of last four minutes spent only on reading the questions	0.3015
12	Speed of reading the passage	-0.3302

CONCLUSIONS

The purpose of the research was to provide a more quantifiable data set for reading standardized tests, specifically the SAT, and use this data to then help improve test takers efficacies to improve scores. The benefit of our approach is that it is easy, quantifiable and can be used on type of student. Our program is an open source program that is available to all who are interested in conducting objective SAT reading data. From our research we have found that the switch count and speed of reading have the lowest negative correlation and the total time and time spent reading the passage at the beginning have the highest positive correlation. Meaning that reading the passage first and the questions while minimizing switches and maximizing time given is the most effective way to read a SAT passage to maximize your score. To better improve our research we want to collect more data from a more diverse population to verify our analysis more objectively and use a statistical test for those with high score and those with low score in order to show strong evidence on the impact of SAT reading patterns.

REFERENCES

- “New SAT Survey Press Release.” New SAT Survey Press Release, Public Relations The Princeton Review, The Princeton Review, Princeton Review
- Daren S. Starnes, Josh Tabor, Dan Yates, David S. Moore, “The Practice of Statistics”, pp. 154.
- Roberts, Hannah. “Facebook's Oculus Purchased a Company That Specializes in Eye-Tracking Technology.” Business Insider, Business Insider, <http://www.businessinsider.com/oculus-acquires-danish-startup-the-eye-tribe-2016-12>
- Khan Academy, <https://www.khanacademy.org/mission/sat/exams>

Perception of Secondary School students about Learning Difficulties and Misconceptions in basic concepts of Chemistry

Rizwan Akram RANA

Department of Science Education, Institute of Education and Research (IER), University of the Punjab, Lahore, Pakistan

Tayyaba M. AKRAM

Department of Science Education, Institute of Education and Research (IER), University of the Punjab, Lahore, Pakistan

Anam ILYAS

Department of Science Education, Institute of Education and Research (IER), University of the Punjab, Lahore, Pakistan

Aisha SAMI

Department of Science Education, Institute of Education and Research (IER), University of the Punjab, Lahore, Pakistan

Hamid IKRAM

Department of Education, Government College University, Faisalabad, Pakistan

Nighat Sana

Department of Science Education, Institute of Education and Research (IER), University of the Punjab, Lahore, Pakistan

Asim NAZIR

Department of Science Education, Institute of Education and Research (IER), University of the Punjab, Lahore, Pakistan

Sidra MUJAHID

Department of Science Education, Institute of Education and Research (IER), University of the Punjab, Lahore, Pakistan

ABSTRACT

The present study is designed to investigate gender discrepancy in learning difficulties and misconception among chemistry secondary school students in Pakistan. Instrument used in this study was a questionnaire, which addressed the misconceptions and learning difficulties. The validity was established by experts and reliability of instrument was determined by pilot testing. Stratified random sampling technique was used on 600 students from government, semi government and private schools. The results reveal that there certainly prevails gender discrepancy in learning difficulties and misconceptions. There is a strong positive relationship between learning difficulties and misconceptions. Males have more learning difficulties and misconceptions than females in chemistry. This study would be beneficial for curriculum designers, researchers, educationists, science teachers, students and for parents.

INTRODUCTION

To investigate students' gender discrepancy in learning difficulties and misconceptions in chemistry was a subject of curiosity for the researchers. A list of all possible factors of learning difficulties (i.e. lack of motivation, language and communication, working memory overload, prior knowledge, and lack of practical work) was made to investigate whether they are responsible in developing the misconceptions among males and females. Misconceptions related to basic concepts of chemistry were taken and their underlying reasons were explored. Basic chemical concepts act as keystones on which other complex chemical concepts are build, if students will have misconceptions in basic chemical concepts then they will certainly have misconceptions in complex chemical concepts as Nahum [1] says that any misconceptions in the fundamental concepts will cause hindrance in the further learning.

Students' learning difficulties and misconceptions in science have been highly researched area for the past couple of decades [5, 6, 8, 9, 13, 14, 15, 16, 17]. In this study all possible causes of learning difficulties were listed and their relationship was analyzed with the misconceptions in the field of chemistry along with the gender discrepancy.

Misconceptions or alternative conceptions are the beliefs which are held by students which are at an orthodox with scientific concepts [2]. Learning difficulties (i.e. Lack of motivation, Language and communication, Working memory overload, Prior knowledge, and Lack of practical work) develop misconceptions among students [17]. Chui [3] examined students' misconceptions at different age levels, through his research, he came to know that sources, such as practical activities, reference books, teaching, language, representation of materials in textbooks or after-school programs effect student's learning in chemistry. Chiu also concluded that children misconceptions at different age levels obstruct the understanding of more complex chemical concepts [3, 18].

There are many sources of misconceptions, which include prior experiences, parents and family, reference materials, media and teachers [4, 17, 19]. All of these sources seem to be reliable to students and causes misconceptions among students. Misconceptions that are present at the age when students start studying chemistry in school persist in minds of learners till they enter university level [5].

Gender and gender stereotype have a significant role in the choice of scientific and technical vocations. Males and females are treated differently at homes and they have different roles and responsibilities in the society as well as they have hormonal and structural differences [20]. In education, gender differences cause discrepancies in learning style preferences, attitudes and views about careers. Gender discrepancy has impact on teaching and learning of chemistry [21]. Demographic variables like gender and age are responsible for the development of misconceptions among students in chemistry [3, 6].

Prior study revealed main causes of misconceptions are poor pedagogy and badly chosen or ill-planned activities [7]. Investigations claim that males and females both have misconceptions in chemistry, but females have more difficulties than their male counterparts in chemical problem solving [7]. It is evident through literature review that the researches based on gender discrepancy found contradictory results [7, 21].

Gender discrepancies in mathematical abilities find out that these discrepancies which will affect how both gender learn the chemistry topics having mathematic aspects [8]. Males have fewer misconceptions related to numerical concepts of chemistry than females. Males have more self-confidence in solving numerical problems in chemistry than females; males are also motivated to do so because they thought it would be fruitful for them in future. Gender discrepancies can be overcome by motivation [9].

Objectives of research

It is evident from literature review that chemistry has a bad image among students due to its abstract nature and its relationship with mathematics, hence it is considered as a tough subject [3]. The purpose of this study is to explore students' gender discrepancy in learning difficulties and misconceptions in chemistry. In addition to gender discrepancy, the relationship between learning difficulties and misconceptions is also investigated. The main objectives of this study are as follow:

1. To find out the link between learning difficulties and misconceptions

2. To find out the gender discrepancy in learning difficulties and misconceptions in chemistry.
3. To find out the influence of students' age on learning difficulties and misconceptions in chemistry.

Hypothesis of Research

The main hypotheses of research are as follow:

H₀1. There is no significant relationship between learning difficulties and misconceptions in chemistry.

H₀2. There is no significant impact of demographic variables (i.e. gender and age) on learning difficulties and misconceptions.

METHODOLOGY

The type of the research is quantitative. The participants of the study include lower secondary school students of Lahore who study chemistry have been taken who filled the questionnaire consisting of items related to learning difficulties and misconceptions. The data was collected personally by the researchers. The collected was then analyzed to review the correlation between learning difficulties and misconceptions.

Sample

The sample consists of 600 lower secondary school students who study chemistry. Stratified random sampling technique was used in the research. Sample including 300 males and 300 females were taken from age group ranging from 13 to 18 years, on the equal proportions from government, semi-government and private sector schools.

Instrumentation

The instrument used in the research was a close-ended Questionnaire. The questionnaire comprises of two parts: first part was used to collect the biographical include information of the participants including their gender, age, class, School category (government, semi-government and private). The second part of the questionnaire was designed by the researchers to investigate the learning difficulties and misconceptions on the basis of literature review. The survey items were constructed using Likert scales. The instrument consisted items relating to learning difficulties (Lack of Motivation, Language and communication, Working memory overload, Prior knowledge and Lack of practical work) and misconceptions narrating basic concepts of Chemistry e.g. matter, physical properties and periodic table.

The validity of the instrument was established by the experts. The reliability of the instrument was determined by pilot testing of the instrument. The data was collected from the lower secondary school students only, who study chemistry as an optional subject.

Data Analysis and Interpretations

Relevant data collected in relation to the study were analyzed by calculating correct responses percentage and applying t-test, correlation and one-way ANOVA (Analysis of Variance).

Correct response percentages for the factor of Misconceptions on Gender basis. From Correct response percentage (Figure 1) it is evident that there prevail slightly less misconceptions in females than in males. Females gave most of the correct responses about basic misconceptions in chemistry.

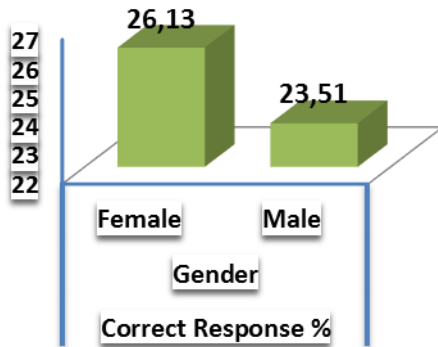


Figure 1. Gender and correct response percentage

Relationship between Learning difficulties and Misconceptions

H₀₁: There is no significant relationship between learning difficulties and misconceptions among students in the subject of chemistry at secondary school level.

Table 1. Relationship between learning difficulties and misconceptions among students in the subject of chemistry at secondary school level.

Variable	N	Pearson r	Sig.
Learning difficulties and Misconceptions	600	0.72	0.00

Table 1 indicates that Pearson r-value (0.72) is significant at $p \leq 0.05$ level of significance so null hypothesis (H₀₁) that is “there is no significant relationship between learning difficulties and misconceptions among students in the subject of chemistry at secondary school level” is rejected and it is concluded from the Pearson r-value i.e. 0.72 that there is a strong relationship between difficulties and misconceptions among students in the subject of chemistry at lower secondary school level.

Gender discrepancies in learning difficulties and misconceptions

H₀₂: There is no significant mean difference of learning difficulties and misconceptions of males and females in the subject of chemistry.

Table 2. Independent sample t-test for mean difference of learning difficulties and misconceptions of males and females in the subject of chemistry.

Variables	N	Mean	df	t-value	Sig.
Male	300	3.38	570.40	2.94	0.00
Female	300	3.33			

Table 2 indicates that t-test value (2.94) is significant at the level of $p \leq 0.05$, so null hypothesis (H₀₂) that is “there is no significant mean difference of learning difficulties and misconceptions of males and females in the subject of chemistry” is rejected and it is concluded that there is significant mean difference of learning difficulties and misconceptions of males and females in the subject of chemistry.

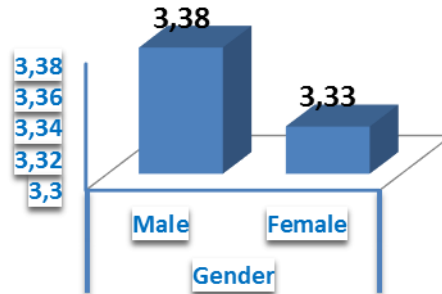


Figure 2. Gender differences and Learning difficulties and misconceptions

Means of learning difficulties and misconceptions obtained on the basis of gender (figure 2) represents that males have more learning difficulties and misconceptions than females.

Analysis based on the influence of age groups on learning difficulties and misconceptions

H₀₃: There is no significant impact of age groups of students on learning difficulties and misconceptions among chemistry students.

Table 3. One-way ANOVA for impact of age groups of students on learning difficulties and misconceptions among chemistry students.

Sources of variations	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	1.04	2	0.518	13.65	0.00
Within Groups	22.65	597	0.038		
Total	23.69	599			

Table 3 indicates that F-ratio =13.65 is significant at $p \leq 0.05$ level of significance, so null hypothesis (H₀₃) that is “there is no significant impact of age groups of students on learning difficulties and misconceptions among chemistry students” is rejected so it is so it is concluded that there is significant impact of age groups of students on learning difficulties and misconceptions.

Table 4. Tukey post hoc for multiple comparisons of learning difficulties and misconceptions of chemistry students on the basis of age groups of students.

Age Groups	Mean difference	Sig.
13-14 Vs. 17-18	0.08	0.00
15-16 Vs. 17-18	0.12	0.00

From the Tukey Post Hoc Test of Multiple Comparisons (Table 4) it is evident that the mean difference of learning difficulties and misconceptions in the subject of chemistry between the students of different age groups is significant at the level of $p \leq 0.05$. Students in the age group 13-14 have more learning difficulties and misconceptions in the subject of Chemistry than students in the age group 15-16, which in turn hold more learning difficulties and misconceptions than students of the age group 17-18.

Mean of learning difficulties and misconceptions based upon age groups reveals that children of age group 13-14 have highest learning difficulties and misconceptions, children of age group 15-16 hold average and children belonging to age group 17-18 have least learning difficulties and misconceptions.

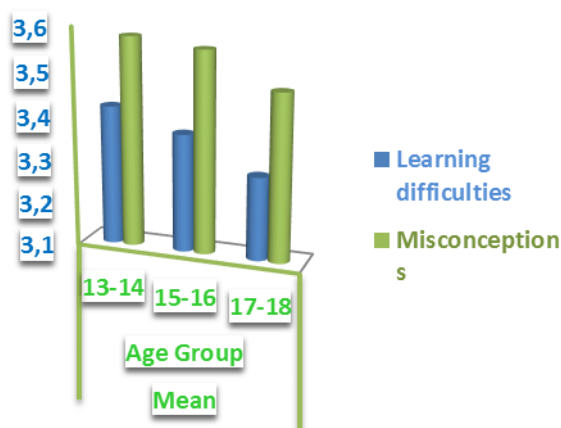


Figure 3. Mean of learning difficulties and misconceptions based upon age groups

DISCUSSION

Chemistry is considered as a difficult subject, as it requires additional concentration to immense variety of activities and skills (literacy, numeracy and experimental skills) as compared to other subjects of science. Chemistry has vast applications and utility in daily life, one cannot think to live without chemistry as one is so much dependent upon the products of chemistry. There is not even a single field which is not influenced by chemistry. In spite of all these utilities of chemistry, students are not willing to make their carrier in the field of chemistry. Its reason may be the abstract and numerical nature of chemistry which seems difficult to the learners [3].

Through this study, researchers found that there is a significant relationship between learning difficulties and misconceptions. Researchers had made a list of all possible factors of learning difficulties (Lack of motivation, Language and communication, Working memory overload, Prior knowledge and Lack of practical work) and checked their relationship with misconceptions and reached at this conclusion that there persists a significant relationship between both. The results of this study are in consistency with the previous findings [4, 3, 7] who believe that: reference books, language and instruction, inappropriate interaction with practical activities, prior experiences etc. are sources of misconceptions among chemistry students. By analyzing gender discrepancies it is concluded that gender has a significant impact in developing learning difficulties and misconceptions among students in chemistry [22]. Demographic variables like gender and age are responsible for the development of misconceptions among students in chemistry [3, 23, 27, 28, 30]. Males have more difficulties and misconceptions than females. Age group of students also have a significant impact in developing learning difficulties and misconceptions among students in chemistry. Students in the age group 13-14 have more learning difficulties and misconceptions in chemistry than students in the age group 15-16, which in turn hold more learning difficulties and misconceptions than students of the age group 17-18. Gender and age of students have a significant impact on number of misconceptions held [8, 24]. Students of all ages hold a wide range of misconceptions [11]. Misconceptions that are present at the age when students start studying chemistry in school persist in minds of the learners till they enter university level [5, 26]. So, the misconceptions must be cured at lower level in order to avoid them in upper level. Gender discrepancy in chemistry is a cross-national problem and it affects the career choices [12, 25]. Temizkan [6] concluded from statistical results that gender difference is effective on students' misconceptions. He also observed gender difference on misconceptions of students. So, the results of this study are in agreement with all the above quoted researches.

From the study's result it is recommended that gender discrepancies can also be overcome by motivation. There should be no gender differentiation among students in classrooms by teachers. Teachers must use audio visual aids to teach chemistry. They should use charts and models to teach complex chemical concepts. And there must be some activities for students so that they can deeply understand chemistry and show interest in it.

REFERENCES

- Adesoji, F. A., Omilani, N. A., & Dada, S. O. (2017). A Comparison of Perceived and Actual; Students' Learning Difficulties in Physical Chemistry. *International Journal of Brain and Cognitive Sciences*, 6(1), 1-8.
- Adejosi, F.A. (2008). Students' Ability Levels and Effectiveness of Problem-Solving Instructional Strategy. *Journal of Social Sciences*, 17 (1), 5-8.
- Azizoğlu, N., & Geban, Ö. (2016). Students' Preconceptions and Misconceptions About Gases. *Balıkesir Üniversitesi Fen Bilimleri Enstitüsü Dergisi*, 6(1), 73-78.
- Buccheri, G. Gürber, N. A. and Brühwiler, C. (2011). The Impact of Gender on Interest in Science Topics and the Choice of Scientific and Technical Vocations, *International Journal of Science Education*, 33(1), 159 — 178
- Bojezuk, M. (1982). Topic Difficulties in O and A level Chemistry. *School Science Review*. 63 (224), 545-551.
- Johnstone, A. H. (2006). Chemical education research in Glasgow in perspective. *Chemistry Education Research and Practice*, 7 (2), 49-63
- Buser, T., Niederle, M., & Oosterbeek, H. (2014). Gender, competitiveness, and career choices. *The Quarterly Journal of Economics*, 129(3), 1409-1447.
- Canpolat, N., Pinarbasi, T., Bayrakceken, S. and Geban, O. (2006) 'The conceptual change approach to teaching chemical equilibrium', *Research in Science & Technological Education*, 24(2), 217-235.
- Chiu, M. (2005). A national survey of students' conceptions in chemistry in Taiwan. *Chemical Education International*, 6, 1-8.
- Gegios, T., Salta, K., & Koinis, S. (2017). Investigating high-school chemical kinetics: the Greek chemistry textbook and students' difficulties. *Chemistry Education Research and Practice*, 18(1), 1-168.
- Horton, C. (2001, June). Student preconceptions and misconceptions in chemistry. In *Integrated Physics and Chemistry Modeling Workshop*.
- Cetin-Dindar, A., & Geban, O. (2017). Conceptual understanding of acids and bases concepts and motivation to learn chemistry. *The Journal of Educational Research*, 110(1), 85-97.
- Gurmu, A. L. (2016). Early Chemistry Misconceptions: Status And Implication On Quality Of Primary Education In Ethiopia. *European Journal of Education Studies*.
- Nahum, L., Hofstein, Mamlok-Naaman, & Bar-Dov. (2004). Can final examinations amplify students' misconception in Chemistry? *Chemistry Education Research and Practice*, 5, 301-325.
- Taber, K. S. (2001). Challenging chemical misconceptions in the classroom. *British Educational Research Association Annual conference* (pp. 1-16). England: Cardiff University press.

- Thompson, F., & Logue, S. (2006). An exploration of common student misconceptions in science. *International Education Journal*, 7(4), 553-559.
- Temizkan, D. (2003). The Effect of Gender on Different Categories of Students' Misconceptions about Force and Motion, Unpublished Master Thesis, Middle East Technical University, Ankara, Turkey.
- Shaheen, M. (2010). Identification of difficult Topics in Teaching and learning of Chemistry in Irish schools and the development of an intervention Programme to target some of these difficulties. *University of Limerick Ollscoil Luimnigh*.
- Tümay, H. (2016). Reconsidering learning difficulties and misconceptions in chemistry: emergence in chemistry and its implications for chemical education. *Chemistry Education Research and Practice*, 17(2), 229-245.
- Lazarowitz, R., & Lieb, C. (2006). Formative assessment pre-test to identify college students' prior knowledge, misconceptions and learning difficulties in biology. *International Journal of Science and Mathematics Education*, 4(4), 741-762.
- Erman, E. (2016). Factors contributing to students' misconceptions in learning covalent bonds. *Journal of Research in Science Teaching*.
- Smith, K. C., & Villarreal, S. (2015). Using animations in identifying general chemistry students' misconceptions and evaluating their knowledge transfer relating to particle position in physical changes. *Chemistry Education Research and Practice*, 16(2), 273-282.
- Naah, B. M. (2015). Enhancing Preservice Teachers' Understanding of Students' Misconceptions in Learning Chemistry. *Journal of College Science Teaching*, 45(2), 41-47.
- Joel, G. E., Kamji, D. T., & Godiya, E. E. (2016). Enhancing Pre-Degree Chemistry Students' Conceptual Understanding of Rates of Chemical Reactions through Cooperative Learning Strategy. *International Journal of Innovative Research and Development* // ISSN 2278-0211, 5(7).
- Cousins, A., & Mills, M. (2015). Gender and high school chemistry: student perceptions on achievement in a selective setting. *Cambridge Journal of Education*, 45(2), 187-204.
- Lin, J. W., Yen, M. H., Liang, J. C., Chiu, M. H., & Guo, C. J. (2016). Examining the Factors That Influence Students' Science Learning Processes and Their Learning Outcomes: 30 Years of Conceptual Change Research. *Eurasia Journal of Mathematics, Science & Technology Education*, 12(9), 2617-2646.
- Lin, J. W., Yen, M. H., Liang, J. C., Chiu, M. H., & Guo, C. J. (2016). Examining the Factors That Influence Students' Science Learning Processes and Their Learning Outcomes: 30 Years of Conceptual Change Research. *Eurasia Journal of Mathematics, Science & Technology Education*, 12(9), 2617-2646.
- Luoga, N. E., Ndunguru, P. A., & Mkoma, S. L. (2013). High school students' misconceptions about colligative properties in chemistry. *TaJONAS: Tanzania Journal of Natural and Applied Sciences*, 4(1), 575-581.
- Vrabec, M., & Prokša, M. (2016). Identifying Misconceptions Related to Chemical Bonding Concepts in the Slovak School System Using the Bonding Representations Inventory as a Diagnostic Tool. *Journal of Chemical Education*, 93(8), 1364-1370.
- Zoller, U. (1990). Students' misunderstandings and misconceptions in college freshman chemistry (general and organic). *Journal of Research in Science Teaching*, 27(10), 1053-1065.

Physical Education with the Ict for Constructivist Learning

Naoki SUZUKI

Tokyo Gakugei University, Japan
nsuzuki@u-gakugei.ac.jp

Seiji OKUMA

Takehaya Junior High School attached to Tokyo Gakugei University, Japan
kumadai@u-gakugei.ac.jp

Satoshi ISHIZUKA

Utsunomiya University, Japan
ishizuka@cc.utsunomiya-u.ac.jp

Takayuki ABE

Tokyo Gakugei University, Japan
abetaka@u-gakugei.ac.jp

Yasutaka OHTA

Hasunuma Elementary School at Saitama City, Japan
m162203p@st.u-gakugei.ac.jp

Hironobu MASUDA

Chuo University Senior High School, Japan
h0703e@yahoo.co.jp

ABSTRACT

ICTs, especially personal computers, are good at analyzing and calculating. Therefore, it tended to be utilized for analyzing the movement and accumulating the results in Physical Education. Although it was seemed that it was effective in behaviorist learning, it is thought that it does not fit constructivist learning. For getting over this difficulty, we devised a method of utilizing ICT based on constructivist learning in Physical Education. The research was carried out by action research to lead the theory in practice. ICT utilization was sorted out through trying to become better practices. Then, they classified into three application settings: activity presentation setting, problem solving setting, and assessment setting. Various methods were developed for use in this application setting. As a result of arranging those methods, it became clear that ICT was a creation tool, a group tool, and a curriculum tool. In other words, ICT was not used personally, it was used in cooperation with others. It became clear that it played the role of feed forward more than feedback. Also, it became clear that the ICT tool was a tool to promote learning scaffolding in constructive learning. That was not a tool for refining and improving movements, but that was effective as a tool for creating movements and coming up with idea through exercises. In other words, the ICT changed from a tool for refining movement to a tool for urging awareness. ICT is an effective tool to promote change in learning in Physical Education where the transition to the concept of constructivist learning hardly progresses.

BACKGROUND

Traditional Learning in Japanese PE has been carried out the skill centered approach (Shimizu, 2015). This approach is based on a behaviorist learning perspective, which shares similar assumptions with structuralism and essentialism. In actual, the skill centered approach unfolds as a process of Drill-Drill-Drill-Main activity. Most of the learning is assumed to transpire through drills, which consume the most of the lesson time.

Constructivist Learning, however, has already been a mainstream of educational theory in Japan since 1990s. Kubota (2003) asserted that the theory on the Constructivist Learning extended to educational area in accordance with the progression of Information Communication Technology (ICT). There, however, is a paradox between the reality and the ideal still now. On the other hand, 1998 course of study(MEXT,1998) described “integrating body and mind” as the assumption of teaching on the purpose of PE. 2008 course of study (MEXT, 2008) was changed the contents based on the constructivist learning. 2017 course of study (MEXT, 2017) was described the active learning as the ways of learning. These shows the constructivist perspectives on the national course of study. That is, it seemed that PE lesson has been changed for good. It was harder for teachers to change their mind to new perspectives.

A representative alternative approach is Teaching Games for Understanding (TGFU: Bunker &Thorp, 1982). This approach is based on constructivist learning theory, which concentrates on learners and games. The assumption is that learners learn how to play through the game. The lesson format is: Game-Practice-Game. Most of the lesson is dedicated to playing the game and learning from the game. As with the skill centered approach, PE teachers intend to teach students how to play the game, although TGFU also emphasizes learning across games; the tactical principles that apply in transferrable ways to different games. That is, learners progress based on their tactical awareness while enjoying playing a game.

PURPOSE

Changes in the national course of study and the research that is ensuing in Japan lead everyone to believe that the future of PE will be defined more by a student-centered approach than a teacher-centered approach. Other important changes are also underway, which suggest Japanese PE is transitioning from a sport-based curriculum. UNESCO (2017) proposed the Competency-based curriculum. Suzuki (2008) emphasized on the Leisure-based curriculum, and breathed beyond school walls. That is, learners progress based on their awareness while enjoying playing. This idea has been spread out all over Japan.

As the society has been changed dramatically, the educational theory has been changed. Especially, ICT has become significant teaching and learning tools since 1995 (See Figure.1). For instance, technology in PE has been utilized to take a video of movements for skill executions. That is, technology in PE is a tool for analyzing. Therefore, teachers often have used it on educational gymnastic. This utilization might be based on the behaviorist learning. Suzuki made an application for teaching an educational gymnastic with FM-Towns including Windows 3.1 in 1997. That application software was awarded by Saitama Prefecture because that was very simple and very easy to use it. Suzuki (2003) published same idea on High jump unit in Junior High School. The way to utilize it was to show the sample movements and to encourage understanding how to move. That was used as digital material instead of document card on which there were pictures. Also, students or teachers took a video of movements and analyze how to move and how to improve it comparatively.



Fig1. Past PE for implementing ICT (1998)

Nowadays has passed more than 20 years since then. Still, this is a common utilization for technology in PE now. That is, there is no change to incorporate the ICT into PE. Many teachers have become to understand the constructivist learning and to teach students with it. There is a description of utilizing the ICT in PE on the course of study (MEXT,2017). Ministry of Education has asked teachers to implement the ICT positively and appropriately. Many subjects implemented new strategies on the instructions. PE had also been implemented so. Their teaching style, however, might be back to the past teaching style when they tried to incorporate the ICT into the PE lesson. So, the purpose of this practical research is to establish the ICT in PE which is based on the constructivist learning.

PROCESS of STUDY

In-service teachers and professors organized special task force team for implementing the ICT in PE. They were considering of utilizing the ICT in PE. They made a concept for using the ICT based on the constructivist learning. Then, they made their idea while doing the pilot lesson and the reflection. As a result, they have led three viewpoints that teachers should think about when implementing the ICT (Suzuki,et.al, 2017).

- 1) Teachers should implement the ICT based on needs which learners want to use, not based on duty which learners should use.
- 2) Teachers should implement the ICT for promoting the exercise time, not reducing it.
- 3) Teachers should implement the ICT for enhancing the awareness for movement, not improving movements.

Based on those basic idea, task force team made a research team with practitioners. There were 2 teams for elementary school PE and secondary PE. Practitioners includes 9 elementary school teachers and secondary teachers. This research method was the action research. The researchers and practitioners cooperated to make better PE lesson with ICT based on the constructivist learning. Then, they had repeated meetings for plan and reflection while sharing their practices. There were many practices idea and screened those under the above three viewpoints. After that, those ideas were classified into same category focusing on the way of using. Then, those setting was labeled appropriately. Those characteristics was led on creating to implement the ICT for constructivist learning.

FINDINGS & DISCUSSIONS

By classifying ideas used in lessons while analyzing the teachers' and / or students' behavior for implementing the ICT, it was possible to divide those into three settings. First, it was an activity presentation setting that utilizes ICT to present information by teacher directly or indirectly utilizing video etc. from teacher.

Secondly, it was a setting where problems were solved by utilizing ICT. Problem solving was united with an assessment strongly. But those that were used immediately were considered as problem solving setting.

Thirdly, it was an assessment setting which was an information gathering process accompanied by value judgment. Stakeholders included not only teachers and children, but also various people such as guardians were involved in the assessment process.

[Activity Presentation]

Presenting activities to be done from now on images all at once, or by presenting them individually made it easier to have a prospect than describing with words. Also, students scheduled learning positively by presenting previous learning to all or individuals. Furthermore, it was possible to interact with the body while exercising through information and develop learning by visualizing heart rates and so on in real time. Thus, students were more active without reducing activity time and being unmotivated.



Fig.2 Examples of Activity Presentation

[Problem Solving]

Students recorded and saved their learning outcomes with typing, video and sound voice. Those were so helpful for them to solve the problems.

Students took videos and discussion their performances while looking back at the records for problem solving. As a result of that, they had a prospect for problem-solving. Also, it was possible to make problem solving easy by writing down their ideas on digital board and recording those. Because they shared their ideas with others on it and looked back at previous their ideas. Working on digital board gave them led to the road for heading to their targets. It was so significant meanings even to take a video to solve the problem. Because students thought how to take a video for good. That is, they often changed angle for collecting good data. That thought led them to good observation for learning. The ICT was very effect as mediator between students and activities. In addition, it was possible to share information with various other people via the network. The way of sharing was the direct dialogue before. They had a new communication online. This was an exactly active learning. Students posted their outcomes and collected feedback from other persons positively. Or students got many information through seeing many posts. Moreover, their awareness was promoted by "visualizing" what "cannot be visualized". That is, the ICT made their learning easier.



Fig.3 Examples of Problem Solving

[Assessment]

The object of assessment was recorded and saved. Generally, learning outcomes pass away in an instant in PE. Therefore, they are hard to remain in the memory of the assessors. ICT, however, saved that information and provide them anytime.

Assessment of cognitive domain might be difficult. It might be often assessed by the performance in discussion or the contents of report card. It was so difficult to grasp it and assess it. It, however, was used for teaching and learning by utilizing ICT. Students were recording the discussion activities and saving it as assessment data. Likewise, descriptions to learning work sheets are often used for assessment of cognitive domain, however it takes time to describe. Therefore, students saved the time by recording voice information and were finished same things in a short time. In addition, Learning assessment of cognitive domain that was difficult to assess, could be made easy since it is possible to add what students were thinking while taking a video in addition to the image. It was easy to visually confirm the changes in the performance. They understood their progression appropriately with implementing the ICT. At that time, the assessment behavior of selecting what to keep was very important self-assessment in developing learning.



Fig.4 Examples of Assessment

In this study, an authentic PE with ICT was developed. The ICT was mainly analyzing tool for improving their movement and strategy on the behaviorist learning. That is, the ICT was used for checking the success of result. Students and teachers, however, implemented the ICT as a creating tool for finding and developing new things based on the constructivist learning. Also, ICT made a big bridge between students. That is, ICT did not help individual learner but help to make learner groups. Then, students worked in a learning community which the ICT bridged. Moreover, the ICT connected between lessons. Because the ICT provided information to students and teachers. They looked back at the past learning and looked forward the future learning. On the above, concept of implementing the ICT was shifted.

- 1) The ICT is not analysis tool but creation tool.
- 2) The ICT is not individual tool but group tool.
- 3) The ICT is not lesson tool but curriculum tool.

CONCLUSION

This study was done to shift the ICT, a teaching tool that has inhibited constructivist physical education learning, to an authentic tool. The research was carried out by action research to lead the theory in practice. ICT utilization was sorted out through trying to become better practices. Then, they classified into three application settings: activity presentation setting, problem solving setting, and assessment setting.

Various methods were developed for use in this application setting. As a result of arranging those methods, it became clear that ICT was a creation tool, a group tool, and a curriculum tool. In other words, ICT was not used personally, it was used in cooperation with others. It became clear that it played the role of feed forward more than feedback. Also, it became clear that the ICT tool was a tool to promote learning scaffolding in constructive learning. In this study, conclusions were led by the case studies of constructivist learning with the ICT. From now on, based on this study result, establishing teaching method is a challenge. In addition, it is important to verify the possibility of ICT as a teaching tool from the relation with learning outcomes.

REFERENCES

- Bunker, D., and Thorpe, R., (1982). *A model for the teaching of games in secondary schools*. Bulletin of Physical Education, 18(1).
- Kubota, K.(2003).*New Educational Practices Based on Constructivism* (pp.12-18). Journal of Computer & Education. Volume 15.
- MEXT. (1998). Course of Study for Junior High School.
- MEXT. (2008). Course of Study for Junior High School.
- MEXT. (2017). Course of Study for Junior High School.
- Shimizu,M. (2015). *Basic Study on Learning Theory on Games and Ball Games-Methodology of a program teaching ball games, to cultivate competences for the 21th Century* (p.21). Bullten of Iwate University, Iwate. Volume 75.
- Suzuki,N.,(2003). *Imaging! High Jump*(pp.76-77). Collection of Lesson Cases. Vol.11. JAPET.
- Suzuki, N.,(2008). Making PE classes based on the complex learning theory, Daigaku-Kyouiku Shuppan.
- Suzuki,N., Okuma, S., Ishizuka, S., & Abe, T., (2017). *Standards for Implementing the Technology in PE*(pp.73-74). Program of the 2017 International Conference for the 6th East Asian Alliance of Sport Pedagogy (Incheon National University, May/24th/2017).
- UNESCO(2017).*The Why, What and How of Competency-Based Curriculum Reforms: The Kenyan Experience*. Current and Critical Issues in Curriculum, Language and Assessment.

Possibilities and Risks of Using Literary Texts in Second Language Teaching

Yılmaz DAŞCIOĞLU

Sakarya University, Turkish Language and Literature Faculty
yilmazd@sakarya.edu.tr

ABSTRACT

Perhaps the hardest job in the world is to have a language and use it. Because language is not only a system that represents the most creative direction of a person, but a complex communication structure at the same time. The acquisition of the mother tongue occurs within a period of the socialization through mathematically (imitation) during a wide range of time. This is a difficult process. But acquisition of a second language is much more difficult. Because, contrary to the acquisition of the first language, second language learning is the result of a conscious effort. Is it possible to use literary texts in second language learning? For this purpose, what are the possibilities provided by literary texts and what are the handicaps they carry? We will discuss them in this paper. In brief, in this paper I will provide an answer to the question whether literary texts can be used in. Undoubtedly, the most creative product of a language is literary texts; it is the comprehension of the metaphors and phrases of the language. Whether it is the mother tongue or the second language, literary text provide a path for a language to be exactly and truly learned. This can only be found in literary texts. Furthermore, literary texts possess factors such as fiction and rhythm that can be effective in language learning. In second language teaching, it can be said that literary texts have features that facilitate and improve language learning if appropriate texts are selected and used at appropriate stages (levels).

Key words: literary text, second language, mother tongue, poem, novel, metaphor

INTRODUCTION

It is unnecessary to explain the fact that everyone knows, the importance of language. Language is the most important tool that distinguishes mankind from other creatures according to many thinkers. Language is a system that allows people to perceive themselves, other people and nature. So it is both an individual action as well as a highly social device that brings the person together. Having a language means being both conscious and action at the same time. This situation requires that the language be understood both as a system and to be able to use it. The learning of the mother tongue takes place spontaneously in a natural social process from early ages:

- Spreading this process over a large period of time,
- Development in an intensive, interactive environment,

so it looks like an easy learning process. Of course this stage represents a major level of fundamental. The next major step in the main language learning is important. It is the improved direction of human language potential.

At this stage, the person has developed abstraction ability, the language has reached a certain level, recognizing the possibilities of expression. Now the level of the mother tongue can go beyond knowing the basic meanings of words. This level is a stage in which one understands and uses the meanings of the metaphor, the idioms and the proverbs. At this stage, literary works are seen as the most creative products of language. From this point on, the use of language is defined as a culture creator, carrier and agent.

“It is important to select the ways and materials used to serve the purpose of the learned language and to be permanent. Literary language is indispensable. For this reason, it is very important to use literary materials (story, fairy tale, theater, fable, poem, short story, memoir, trial, humor, cartoon, joke etc.) in foreign language teaching.” (Medni, 2010).

The person who uses the language consciously reflects the culture he has created and carries at the same time. This point is where the language combines science and philosophy with thought. Again, this point is the point where the language combines art with emotion. The progress of the mother tongue learning can be passed with certain ease for those who live in the social and cultural atmosphere that the language creates.

DIFFERENCE BETWEEN TEACHING/LEARNING SECOND LANGUAGE AND MAIN LANGUAGE

Second language learning has various difficulties since the beginning. The most important difficulties of these is the difference between the second language and the main language learning. Native language learning is the period when language is replaced by an object, concept, or sensation. In the second language learning, however, this situation becomes a transition from one language to another. In other words, the second language, instead of anything of nature, is confronted, compared and tried to substitute in some measure the language which is a system previously acquired by the learner like himself. In this case, the mother tongue has a resistance.

The presence of the mother tongue can turn the learning of a second language into an admission or opposition relationship.

Examples that illustrate the ease of learning a second language in an environment where the use of the mother tongue is prevented or not needed supports this view.

At this point it is open to debate whether the mother tongue is well known or whether the language rules and the uncertainty of the creative direction as a mimetic user will contribute to the learning of the second language. The answer to this question will also show whether or not literary texts can be utilized in second language learning/teaching.

SECOND LANGUAGE LEARNING/TEACHING AND LITERATURE

The metaphor of Ferdinand de Saussure's (1916/1959) famous chess game can also explain the relationship between language and literature. Accordingly, 'language' has a general and abstract structure like game rules. The application of these rules constitutes 'literature'.

According to Jakobson's (1960) functional classification, language is the basic function of communication. It also has a poetic (artistic) function. The conversion of the language of the word is first of all in daily conversation, that is, communication uses. Communication forms the norm of a language. This standard structure is based on teaching the basic meanings of words. A language is a correct and complete understanding of the basic meaning as much as possible in the transfer between the target speaker and the interlocutor at this first level, which must be learned by non-native speakers. Because the language of communication carries the purpose of communication, it is based on the basic meanings and understanding of the news to be conveyed.

Undoubtedly, the first and main goal of foreign language learning is to provide these communication language standards. The distinction between communication, language and literary language begins at this point: Because literary is the most creative representation of language. In addition to Jakobson's thoughts Eagleton (2014) thinks that literature converts and separates language from daily language.

Since the literary work carries an artistic purpose, the communication function is either absent or secondary. The main aim of an artist is to create an aesthetic pleasure. So the language in the literary work, the text turns itself into itself. By changing the simile of Valery (1923/ 1939); we can say that the communication language is like walking, and the artistic language is like dancing. The first step takes the communication, the second one takes the aesthetic position. However, the use of spoken language and communication, language is not static. There are, of course, metaphorical language factors in the daily language level. There are many metaphorical uses on everyday. There is a strict exchange and transitivity between the literary language and the communicative language. The possibilities of communication, language constitute a potential and norm for the artist. The metaphorical vocabulary and expression possibilities produced on the literary level increase the power of the communication language and make continuous contributions to its development.

Undoubtedly, the most basic aim of a second language learning is to communicate, to express it with that language. However, the artistic and cultural potential of a language is its aesthetic accumulation. It creates a shooting point for the person who wants to learn it outside of the native language. This task, of course, will also raise the question of how technical literary works can be used for second language teaching.

The basic feature of the literary language is figurative, that is, a metaphorical aspect. The metaphorical nature of literary language is the most important factor that makes it difficult to understand. On the other hand, the most important indicator of knowing a language, either as a mother tongue or as a second language, is to understand and use these figurative language structures. We can say that someone who can use that language in a creative way for a reader, who can understand an image in a poem, and understand a metaphor in a proverb, and meanings of a figure in a story.

Disadvantages of literary texts in terms of language teaching:

- Metaphorical language, frequent use of literary arts
- The vocabulary is so wide
- Syntax often deviates from the norm
- The formation of the context within literary text

In order to reach this point, it is necessary to contact the texts where grammar and vocabulary are used in a natural and creative way. Contact with literary texts is, of course, a general term, and it is absolutely necessary to select texts according to their level. Otherwise, imputing a text that is well above the level of the language learners may lead to the stalling of the language and the process of learning. One of the questions that should be considered at this point is whether the texts to be used for teaching should be original texts or should be done according to different levels by working on them. The answer to this question, of course, will be second. In other words, the text should be organized according to the level of the student groups. For this purpose, the authors and the publisher should also be allowed to simplify the original sentences according to their level of sentence structure and apply the same procedure to the word selection. This is a matter of debate; because, according to many writers, the literary text has been completed as the author has created and cannot be changed. On the other hand, this problem seems to be solved when it comes to education. For educational purposes, it is natural that the works of art should be handled as text. Let us take a look at the possibilities of second language teaching in terms of characteristics of literary genres in order to open this subject.

There are many different classifications and definitions of literary genres. We can categorize into three main categories on this subject.

In this frame, literary genres are poetry, fictional species, and life-reflecting species. The main feature of this classification is the difference in the purpose of using languages. According to this separation, the language of poetry is known to be the most creative and unique representation of the language. The characteristics of texts in novels, stories, theater and other narrative genres are due to their representative and fictional nature.

Memory, diaries, travelogue and letters are also texts that inform, curious, and sometimes excite the reader. Species such as essay tell a specific subject in a compact manner. Such writings are both informative and readable. Each of these genres carries features that can be useful in second language teaching on their own.

As is known, poetry has three characteristic features. We can rank these features without regarding their importance:

- Poetry has rhythm and musical harmony
- Poetry aims to create an image
- Poetry contains metaphors

These general characteristics of poetry can also be exploited or pointed out in second language teaching. The first striking feature of poetry written in almost all languages is harmony. This is not only in traditional poems written in rhyme and rhyme, but also in modern poetry.

This characteristic of rhythm, which usually comes from conscious repetitions and their conscious decimation, is a qualification aimed at understanding the taste factor as well as the content factor. Until many idioms and proverbs from fairytale singularities, this characteristic which is widely encountered in language, cultural products is an opportunity for the instructor. Rhythm is an entertaining teaching factor in all ages. Because it both creates a pleasant feeling and is an effective tool to keep the words in memory.

CONCLUSION

Fictional genres (such as novels, stories, theatre) use structural curiosity, dramatic elements, action, and dialogue. All these factors make it necessary to use works written in these genres during the second language teaching. As conclusion, it is possible to take advantage of the influence of curiosity, interest in dramatic items and spoken language features in language teaching. By choosing works in these genres, the extent of the existence of words, the place where abstract-concrete expressions are held, and whether the syntax is appropriate for students should be considered.

It is known that the texts in the fiction genres will lead to the fact that the language structures that emphasize the phenomenon and thus manage to drive the sense of curiosity are natural to learn from behind the scenes. The same is true of other dramatic items; It is also necessary to remind that texts such as speech, internal speech are also used.

Artifacts, such as memorabilia, travel writings, interviews, letters, and essays can be used as useful texts in a few aspects. First of all, such works have an extensive cultural accumulation.

What is important is that such works are easy to read because the language is usually close to the daily conversation and chatting language. When choosing texts in these genres, the level of the reader / learner and the direction of the interest should be taken into account.

As a result, it is a sign that literary works are read and understood, and that the language is learned in an advanced and creative way. In this respect, the literary text should be regarded as a goal and a motivation factor for language learners. The second role of the literary text in language teaching is to use it as a naturally produced auxiliary resource.

Literary works in this direction;

- Sometimes enjoyable,
- Sometimes sad,
- Sometimes curious,
- Sometimes exciting
- Sometimes informed

It is possible to use it as a natural education material. A selection of literary texts in various genres will contribute to teaching language by considering the levels to be determined for target reading. This contribution will make it easier to learn the language more loving than before, to cultivate it as a carrier of language. To contribute to the comprehension of theoretical knowledge through literary texts. It will have additional benefits such as increasing the motivation and self-esteem of the student.

REFERENCES

- Eagleton, T. (2014). *Literary Theory-An Introduction*. (Translated by: T. Birkan). İstanbul: Ayrıntı Publishing House.
- Jakobson, R. (1960). *Linguistics and Poetics*. T. Sebeok, *Style in Language*, pp. 350-377.
- Medni B. (2010). *Arapça öğretiminde edebi materyallerin kullanımı*. Master Thesis: Gazi University Education Institute.
- Saussure, F. de. (1959) *Course in General Linguistics*. W. Baskin (Translated by). New York: Philosophical Library, (First published. 1916).
- Valery, P. (1939). *Art, Esthetique, Poesie. 9 Conférences, Discours et Propos*. (First published. 1923)

Postgraduate Courses on a Virtual Classroom Platform

Ömer EREN

Gaziantep University

omereren2003@gmail.com

Tuçe ÖZTÜRK

Çukurova University

Cengiz TURAN

Adana Science &

Technology University

cengizturan01@gmail.com

Erdoğan BADA

Çukurova University

lingbada@gmail.com

ABSTRACT

Advances in technology have enabled educators to move further from the physical limitations of a classroom atmosphere. Integration of usual classroom courses into distance learning modules has been carried out worldwide. However, these distance learning modules generally consist of offline courses prepared in advance. There are also many educational institutions where courses are offered via interactive web-based platforms. Still, these courses are designed for undergraduate levels and there is not much research concerning the potential for integration of post-graduate studies into online courses. In this study, researchers investigated students' attitudes towards a PhD course which was administered interactively via distance learning. Findings show that the experience led to positive effects along with operational adversities which sometimes made the lesson flow unfeasible. The outcomes are discussed in light of relevant studies.

Keywords: post-graduate study, online learning, distance learning, Web 2.0

INTRODUCTION

Living in a technologically surrounded world requires people to adopt the changing nature of the daily life needs. In almost all aspect of our lives we can clearly witness the dominant use of technology. Being a member of an information society has transformed our lives into a world in which we can create a virtual presence anywhere and anytime. As Negroponte's (1995) predictions are coming true, we have become individuals living in a post-physical age where all solid things are melting into bits.

Web-based services, which provide users interactive information have spread all over the world in an unbelievable pace. These services, also known as Web 2.0 tools, allow users to combine and interact among audial, visual and textual elements (O'Reilly, 2005). In particular, social networking sites are quite popular and serve as state-of-the art by enabling people to reflect their presence on a virtual environment in which they can carry on their daily needs. To name a few, Facebook, Youtube, Google+ and Twitter are very common networking sites. In terms of educational use, Adobe Connect allows users to carry out real-time video conference options. The participants can be physically distributed anywhere in the world but they intervene and lead conversations synchronously. They can also send text messages and share their files with others. Features on this software permit to share presentations and other documents with other attendees together with their live footage. Participants can view, edit and interact with all files smoothly.

The popularity of social networking sites have created a big interest and enthusiasm among people from various disciplines to take part in this stunning world and we have reached to a point that whether as a human or as company, we are trying to show our existence as virtual bodies.

This novel approach inevitably has affected educational environments as well. The potential of these sites for educational purposes has been investigated by many researchers all over the world. It is stated that social networking sites have expected requirements and outcomes of an official education and they suit well with the needs of today's digital native students (Mason, 2006; Hockly, 2011; Illes and Akcan, 2017).

The interactive nature of social networking has gained a new epoch to online learning. Traditionally, online learning is viewed as a transmission of knowledge via synchronous or asynchronous web portals. This kind of learning was not very different from watching a video about a particular lesson in which learners did not have opportunity to participate. Thanks to the successful integration of all visual elements, online learning has become the North Star of education. Educational authorities have been making a considerable amount of investment on online learning. In 2011, it was estimated that no less than 35.6 billion dollars was spent on online learning. It is an industry with more 55.2 billion dollars and it is expected to double in upcoming years (E-learning Magazine, 2013).

A meta-study conducted by the US Department of Education in 2009 stated that older learners who learn in online conditions performed modestly better than those learning the same material through tradition face-to-face instruction. This empirical evidence also suggests that blended course have greater impact on learning (Means, Toyama, Murphy, Bakia & Jones, 2009). As we can see, the popularity of online learning is increasing day by day together with the increase in the use of social media. The efficacy of these social networking sites for educational purposes has been expressed by numerous researchers (Baird & Fisher, 2005; Chan & Cmor , 2009; Akçay & Arslan, 2010; George & Dellasega, 2011; Cullen, Kullman & Wild, 2013).

Studies reveal a big interest in the integration of social media for educational use. However, current studies in literature mostly deal with language teaching and undergraduate courses. We can hardly see researchers interested in the feasibility of this social media in terms of graduate aspect. Graduate students need online courses far more than other students. In some places, they tend to be working people who shoulder academic life and business life together. In other places, they can be academicians commuting incredible distances to attend courses from different universities. This creates a huge time and space constraints for graduate students.

Interestingly, the profiles of graduate students match very well with the expected outcomes from online education. Previous educational experiences of these learners create a backbone and pave the way to reach the expectancy of the courses. This prior knowledge is an important compensation to negate the criticisms that underestimate online learning for having low quality. For example, Koenig (2010) states this fear by expressing online learning as not meeting the standards of a good official education. However, graduate students are self-regulated learners and they show high degree of self competence to achieve learning goals of the course (Grow, 1991). They are also expected to be more intrinsically motivated to learn as they have chosen to go on an advanced degree.

A study by George and Dellasega (2011) is worth mentioning regarding students' attitudes towards interactive social media tools integrating real-time dialogues via Skype with other sites. The researchers conducted two pilot studies about graduate-level medical courses in the US. In order to promote student learning, social media tools were integrated into the humanities curriculum. Students gave high favourability ratings in both courses. It is stated that social media can augment learning opportunities within the humanities curriculum in medical schools. Social media applications, especially Skype and YouTube, provided a ground in which new experiences of learning could occur. Students were able to reach external experts and new educational context via real-time dialogues with instructors.

It can be seen that with the advance of technology, the attempts of applications of new technology and programs to education seems to be attractive.

METHODOLOGY

Objectives of the Study

The central purpose of this study is to identify the weaknesses and the strengths of using Adobe Connect for an online PhD course of English language Teaching Department. In other words, in this study the effectiveness of utilization Adobe Connect for academic purposes has been examined and clarified.

The study addresses the following research questions:

1. What are the strengths of using Adobe Connect for academic purposes?
2. What are the weaknesses of using Adobe Connect for academic purposes?
3. Is it useful to utilize Adobe Connect for academic purposes? Why or why not

Participants

In order to collect the needed data on the utilization of hangout for academic purposes, an ELT professor and four PhD students of English Language Teaching Department at Çukurova University participated in this study. The students attended ENG 816 SLA Research for Language Teaching course for the spring semester of 2014 by connecting through Adobe Connect from three distant cities (Adana, Diyarbakir and Gaziantep). In other words, the data needed for this study were gathered from four PhD students who were working in different universities as foreign language teachers in Turkey. The demographic data on the participants is presented in Table 1:

Table 1: *The Demographic Data on the Participants*

The participants	Age	Sex	University	Department	City	Years of working experience
The Professor	-	-	-	-	-	-
Student 1	26	female	Çukurova University	English Language Department	Adana, Turkey	5
Student 2	28	male	Gaziantep University	School of Foreign Languages	Gaziantep, Turkey	6
Student 3	26	male	Adana Science & Technology University	School of Foreign Languages	Adana, Turkey	5
Student 4	30	male	Dicle University	School of Foreign Languages	Diyarbakır, Turkey	8

As understood from Table 1, it can be seen that one of the participants is female and the rest are male. Their average age is 27.5. Additionally, the average of their years of working experience is 6 years.

Data Collection and Analysis Procedure

So as to answer the research questions given above, the needed data were gathered by the help of the reflections of the participants on the PhD course of "ENG 816 SLA Research for Language Teaching" offered by Prof. Dr. Erdogan Bada at Çukurova University. The course was an online one which was organized by connection of the participants through using conference program Adobe Connect.

On the first week of the session, the syllabus of the course was presented on a blog by the professor to the students. So each week one of the participants made a presentation on the week's topic, which had been appointed on a blog before the session. In order to clarify the situation, the snapshots of the syllabus were presented below:

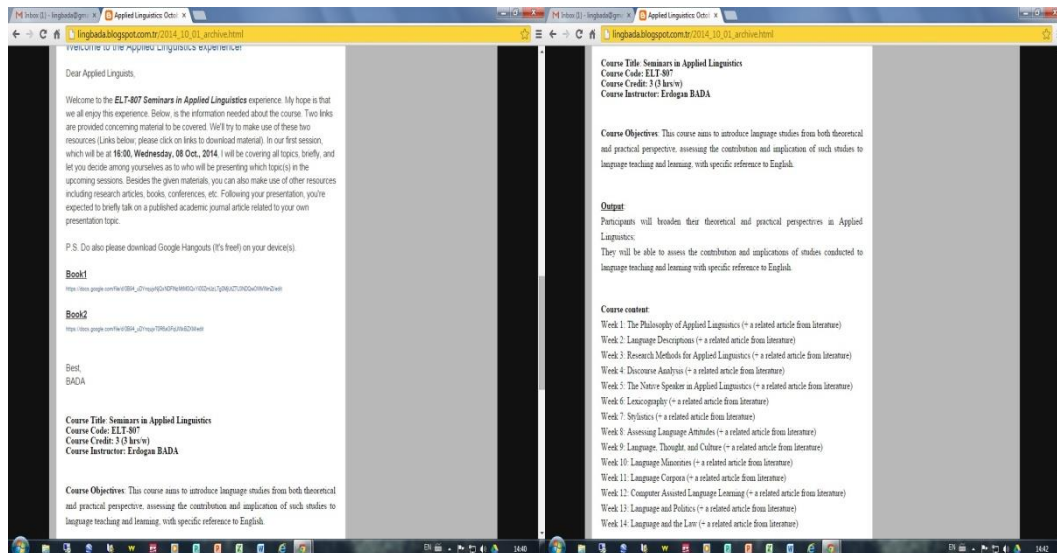


Figure 1: The snapshots of the syllabus

At the end of the semester the participants were asked to reflect their ideas on the weaknesses and the strengths of using Adobe Connect for such academic issues. In the light of the reflections expressed by the participants on the experience they had, the research questions were answered. In other words, within the data analysis procedure, a content analysis of the reflections was carried out to elicit the participants' perceptions on how effective Adobe Connect for utilization of such purposes and being familiar with their insights on this software.

Reflections on Virtual Learning Experience

Four PhD students from three distant cities (Adana, Diyarbakir and Gaziantep) attended ENG 816 SLA Research for Language Teaching course for the spring semester of 2014 through video conferencing program called Hangout. The course covered 14 weeks. At the first session, the participants of the course introduced themselves to each other and the professor, Dr. Bada, provided the participants with the syllable including the course title, code, credit, objectives, and content. After a brief introduction of the course content, the topics to be covered were appointed to the participants so that they could present and share a related article throughout the semester; in this way, it was made clear what to expect from each session. Also, it was stated that each participant would prepare a PowerPoint presentation on one of the relevant articles concerning the week's topic and put them on the professor's blog beforehand so that others could study before the session.

FINDINGS

At the beginning of the semester, the participants' first impression was that it was a unique experience and an opportunity to attend a PhD course without travelling long distances. Although unease to some extent was felt due to its being the first time to attend an academic course, it disappeared thanks to the opportunities the program offered and, more importantly, thanks to the well-established structure of the course. The computer program, Adobe Connect, is also integrated with such elements as messaging and file sharing that is why during the sessions further notes could be exchanged. The program also made it possible for a presentation to continue smoothly when there are questions to ask others while not interfering with the presentation made at the time of speaking. Through the end of the semester, it was mentioned that the course encouraged the participants, who are also full-time instructors of English or research assistants at ELT departments at universities, to integrate technology in their own classroom more.

One common difficulty shared with all participants was the low connection speed at times. Depending on the locations of the participants, different connection speeds were experienced. Some of the participants attended the sessions with no problem throughout the semester, whereas some presentations were hardly heard and even connections were lost from time to time. Participants also stated that due to this problem, question-answers during the session were sometimes not successful enough. As another outcome of the low connection speed, video quality was also poor, which made it difficult to follow the presentations.

From these notions, it was clear that when A PhD course is attended by motivated graduate students, who are also experienced teachers, it does not cause management problems; however, common concern is the effectiveness of it in a possible undergraduate level course – it is estimated that serious participation problems may occur.

Another problem stated by participants was related to eye contact. Since eye contact can sometimes be hard to sustain – and thus the attention on the screen may be distracted by some other windows or webpages – it was stated that it might be terribly difficult for any participant to be all ears to what is being said or displayed on the window powered by Adobe Connect

One suggestion by some participants is that besides its many benefits, at least one or two sessions could be carried out in a physical classroom to help participants to get to know each other and maintain a friendlier atmosphere throughout the semester.

DISCUSSION&CONCLUSION

The present study is about an Adobe Connect-oriented PhD course which was joined by four students and one Professor. In this experience, it was revealed that Adobe Connect presents both positive and negative outcomes in terms of sustainability. As Mason (2006) acknowledged, online education system is more advantageous than face-to-face courses. In particular, the stress-free environment and the physical and acoustic comfort experienced by the participants outweigh the advantages provided by conventional educational settings. What is more, as Akçay & Arslan (2010) stated, the sense of enjoyment disseminated throughout the online courses is perceivably more pleasurable to the participants.

Having said these, there exist some irreversible drawbacks to the use of online systems as a replacement for conventional settings. Among these, the diehard role of the Internet is of prime importance as long as the interplay between the Internet and distance learning is sustained. Although endorsed as a “flexible and creative” tool (Baird & Fisher, 2005), web-based education systems, in their own sakes, require substantial connection power when it comes to providing a life-like venue for education. In a similar vein, George & Dellasega (2011) argue that it is highly likely that the effect of online tools will remarkably increase in the future, which, they think, will bring about an escalation of internet-induced problems.

In light of these notions, we conclude by stating that Adobe Connect is an effective tool to be used in online education systems although it requires substantial broad-band internet connection for a smooth lesson flow.

This study has several limitations. Initially, the group size was remarkably small; the students comprised PhD students only, and no programs other than Adobe Connect were used for comparison.

REFERENCES

- Akçay, A., Arslan A. (2010); The using of blogs in Turkish Education, *Procedia Social and Behavioral Sciences*, 1195–1199.
- Baird E, Fisher M. (2005). Neomillennial user experience design strategies: utilizing social networking media to support “always on” learning styles. *J. Educational Technology Systems*, Vol. 34(1) 5-32.
- Chan, C. & Cmor, D. (2009). Blogging toward information literacy: engaging students and facilitating peer learning. *Reference Services Review*, 37(4), 395-407.
- Cullen, R., Kullman, J., & Wild, C. (2013). Online collaborative learning on an ESL teacher education programme. *ELT journal*, 67(4), 425-434.
- George, D. R., & Dellasega, C. (2011). Use of social media in graduate-level medical humanities education: Two pilot studies from Penn State College of Medicine. *Medical teacher*, 33(8), e429-e434.
- Grow, G. O. (1991). Teaching learners to be self-directed. *Adult education quarterly*, 41(3), 125-149.
- Hockly, N. (2011). The digital generation. *ELT journal*, 65(3), 322-325.

- Illés, É., & Akcan, S. (2017). Bringing real-life language use into EFL classrooms. *Elt Journal*, 71(1), 3-12.
- Koenig, R. J. (2010). A study in analyzing effectiveness of undergraduate course delivery: Classroom, online and video conference from a student and faculty perspective. *Contemporary Issues in Education Research (CIER)*, 3(10), 13-26.
- Kumar, S., & Johnson, M. (2017). Online mentoring of dissertations: the role of structure and support. *Studies in Higher Education*, 1-13.
- Mason, R. (2006). Learning Technologies for Adult Continuing Education. *Studies in Continuing Education* , 28:2 121-133.
- Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies. *US Department of Education*.
- Negroponte (1995) Negroponte, N. (1995). Being digital, 1995. *London, UK: Hoder and Stoughton*, 65-67.
- O'Reilly, T. (2005). What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software. <http://oreilly.com/web2/archive/what-is-web-20.html>

Reinterpreting the Flesch Readability Scale for the Information Age

Jan E.J. STEWART

Chikushi Women's University

Dazaifu, Japan

stewart@chikushi-u.ac.jp

ABSTRACT

For more than seventy-five years, *Flesch Reading Ease* has been an important measure of the readability of a passage. In this paper, examples that Flesch used are re-analyzed. Flesch originally interpreted his readability scale in terms of school grade levels, but changes in reading difficulty, as well as readers' abilities, suggest that an interpretation based on *occupation* may be more suitable for the twenty-first century. Recent changes in the workplace, resulting from computerization, require a further shift in interpretation of *Flesch Reading Ease* to one of *social functionality*. Examples from digital media verify this interpretation. (97)

INTRODUCTION

Many educators will recognize *Flesch Reading Ease* as an important measure of the readability of a passage. In the seventy-five years since its inception, the Flesch readability scale has become one of the most frequently cited instruments for determining readability of documents. Though it has become a standard for measuring readability, the various components of "reading ease" may not yet be fully understood.

There are three numbers or sets of numbers associated with *Flesch Reading Ease*. The first is the *Flesch Readability Formula*. This simple formula, based on the average number of syllables per word and the average number of words per sentence, produces a readability scale known as *Flesch Reading Ease* (henceforth FRE). This gives us a numerical value, on a scale of 0 to 100, by which to appraise a text. Reading difficulty is considered to be inversely proportional to this numerical score. A third factor, *School Grade Level*, gives us a method of interpreting the score.

Flesch's formula, developed in the 1940s, has withstood the test of time. Yet research indicates that the interpretation of scores attained today by the *Flesch Readability Formula* may differ somewhat from the original interpretation suggested by Flesch, both in terms of the difficulty of the passages he used as examples, and in terms of the school grade levels that correspond to the scale. Exemplary passages have become more accessible to their intended audiences, due in part to the influence of the *Flesch Reading Ease* measure itself. In addition, school grade levels have shifted somewhat, due in part to the influences of the Information Age and different forms of written texts.

In this paper I will demonstrate that the same reading materials which Flesch evaluated years ago do not yield

the same results today, even when analyzed according to his own formula. Next, I will suggest a modified interpretation of the scores, an interpretation suitable for the twenty-first century. Finally, I will suggest broad categories of interpretation that reflect changes to society in the Information Age.

THE FLESCH READABILITY FORMULA

Rudolf Flesch (1949) developed his readability formula as a means of evaluating adult reading materials, basing his formula on the average number of words per sentence and the average number of syllables per word:

$$206.835 - 84.6 (\text{syllables/word}) - 1.015 (\text{words/sentence}) = \text{Flesch Reading Ease}.$$

The readability score can range from anywhere below zero to 120.2 (for example, in a passage consisting entirely of simple two-word sentences, “I go. We go. You go. They stay.” FRE = 120.2.) Flesch then interpreted the scores in terms of school grade levels (in the American K12 system¹), predicting readability based on formulas derived from McCall and Crabbs’ *Standard Test Lessons in Reading* (1925). Table 1 shows Flesch’s original model of how the scores should be interpreted.

Table 1. The Flesch Readability Scale.

Score	School Level	Example
90 to 100	5th Grade	Comics (92)
80 to 90	6th Grade	Consumer Ads (82)
70 to 80	7th Grade	Movie Screen (75)
60 to 70	8th and 9th Grade	<i>Seventeen</i> (67) <i>Reader’s Digest</i> (65) <i>Sports Illustrated</i> (63) <i>N.Y. Daily News</i> (60)
50 to 60	10th to 12th Grade	<i>Atlantic Monthly</i> (57) <i>Time</i> (52) <i>Newsweek</i> (50)
30 to 50	College	<i>Wall Street Journal</i> (43) <i>Harvard Business Review</i> (43) <i>New York Times</i> (39) <i>N.Y. Review of Books</i> (35) <i>Harvard Law Review</i> (32)
0 to 30	College Graduate	Auto Insurance Policy (10) <i>Internal Revenue Code</i> (– 6)

REEXAMINING THE FLESCH SCALE

A previous study (Stewart, 2003) arose from a deepening suspicion that Flesch’s interpretation of the *Internal Revenue Code*, his most difficult example, had been exaggerated, possibly as a means of grabbing people’s attention. A reexamination of *all* of Flesch’s examples (over 100,000 words) revealed that reading difficulty has changed over the course of time. The following summarizes those findings.

1. Comics. Flesch claimed that comics have a readability score of FRE 92, but there are different types of comics: comic *strips* (four frames in daily newspapers) and comic *books*. When retested, comic *strips* had a readability score of FRE 88.53; comic *books* had a readability score of FRE 81.32. Combined, they produced a score of FRE 85.43.

2. Consumer Ads in Magazines. More than one hundred samples of consumer advertisements were analyzed. While Flesch predicted that these would have a score of FRE 82, advertisements today have a score of FRE 62.32, nearly twenty points lower (more difficult) than Flesch's original estimate.

3. Movie Screen. It is not entirely clear what Flesch meant by "movie screen," which he assigned a readability score of FRE 75. However, the scrolling and receding onscreen prologues of *Star Wars I-VII* (1977-2016) produced a score of FRE 52.27.

4. *Seventeen*, *Reader's Digest*, *Sports Illustrated*, *New York Daily News*. Flesch originally reported that these periodicals fell within the 60-70 range on the Readability Scale. Although this remains true in the case of the adult publications, *Seventeen*, aimed at a teenaged audience, scored notably higher (FRE 77.57).

5. *Atlantic Monthly*, *Time*, *Newsweek*. Flesch reported that these publications fell within the 50-60 range on the Readability Scale. *Atlantic Monthly* was found to have a readability score of FRE 52.67; *Time* scored FRE 56.95; *Newsweek*, FRE 58.18.

6. *Wall Street Journal*, *Harvard Business Review*, *New York Times*, *New York Review of Books*, *Harvard Law Review*. Flesch originally reported that these publications fell within the 30-50 range on the Readability Scale. Most of these publications today have slightly easier readability. Only the *Harvard Law Review* remains about the same (FRE 34.20, compared to Flesch's estimate of FRE 32).

7. Standard Auto Insurance Policy. As a result of "plain English laws" governing consumer contracts, many states now require that insurance policies be written in language that is easy to understand. A score of FRE 59.76 obtained for a standard insurance policy may therefore be considered an artifact of the works of Rudolf Flesch.

8. Internal Revenue Code. Section 23(p), the part analyzed by Flesch (FRE -6) and Title 26-404, the same passage in today's language (FRE 9.84), pertain only to pension plans. When this and sixty-eight other sections of the *Internal Revenue Code* were analyzed, the sample produced a score of FRE 52.57.

REINTERPRETING THE FLESCH READABILITY SCALE FOR THE INFORMATION AGE

Flesch's interpretation of readability scores notably relies on school grade levels (from fifth grade to college graduate) to illustrate the reading difficulty of a text. However, a closer look at his examples reveals a number of inconsistencies. First and foremost, the "school grade level" of the exemplary texts has nothing to do with their intended audiences. Sixth grade pupils have very little purchasing power compared to the adult work force, so it is not likely that "consumer ads in magazines" should be used to exemplify sixth grade reading materials. Similarly, none of the reading examples with a readability score in the range of FRE 50-80, with the possible

exception of *Seventeen*, appeals to the audience that corresponds to the grade level that Flesch described. Secondly, as mentioned in number 7, above, certain types of documents are now being written at a specified level of difficulty, taking into account the *reading abilities* of their intended audiences. These discrepancies suggested that a more practical method of interpreting the readability scores, an interpretation based on the concept of *audience appeal* rather than school grade level, should be sought.

With this in mind, all the publications originally listed by Flesch were arranged in order of their current difficulty. This list produced five distinct categories of *audience appeal*: K12 student, blue-collar workers, white-collar workers, professionals, and statesmen.² A new range of readability scores, corresponding to *occupation* rather than *school grade level*, was then derived. Table 2 summarizes this interpretation.

Table 2. A Twenty-first Century Interpretation of the Flesch Readability Scale.

20th-Century Level	Flesch Index	21st-Century Level	Examples (21st-Century Analysis)
Fifth - Sixth Grade (80-100)	90 – 100	Elementary School	<i>Peanuts</i> (95)
Junior High School (60-80)	80 – 90	Junior High School	<i>Stuart Little</i> (86)
	70 – 80	High School	<i>Seventeen</i> (77)
	60 – 70	Blue-collar	<i>Sports Illustrated</i> (67) Consumer Ads (62) Auto Insurance Policy (60)
High School (50-60)	40 – 60	White-collar	<i>Time</i> (57) <i>Internal Revenue Code</i> (52) <i>New York Times</i> (48)
College (30-50)	20 – 40	Professional (Lawyer, Physician)	Medical Journals (34) <i>Harvard Law Review</i> (34)
College Graduate (0 – 30)	0 – 20	Statesman	Preambles, Resolutions etc. (1-26)

We have thus far shifted the interpretation of the Flesch readability scale from an *educational* perspective, which Flesch advocated, to an *occupational* perspective, which more accurately reflects reading audiences today. However, some job categories are undergoing a major transformation due to automation, computerization and globalization, products of the Information Age. This has affected blue-collar workers in particular (assembly line workers, data processors, etc.), who must deal with the change in one of two ways. They must either move up the ladder, re-educating themselves to become “knowledge workers” (consultants, teachers, journalists, executives, etc.), or accept lower-paying service jobs. This necessitates another change in perspective of the interpretation of *Flesch Reading Ease*, this time from an *occupational* perspective to one of *social functionality*.

In order to reach a better understanding of the readability demands of the Information Age, we may look to several digital media that did not exist when Flesch developed his formula. When analyzed, *Wikipedia* yielded the most difficult score, FRE 34.67, roughly equivalent to Medical Journals and the *Harvard Law Review* of 75

years ago. Descriptions of half a dozen online games (playstation.org) were the next most difficult, scoring FRE 49.9, appropriate reading for a college freshman in Flesch's day, or a white-collar worker today. Social media such as blogs, e-mails, and tweets scored FRE 50.1, 56.2, and 63.6, respectively. Facebook scored FRE 70.5, which Flesch would have considered junior high school level.

Most parents of elementary school pupils prefer to monitor their children's access to the Internet. Nonetheless, the Internet has come to provide valuable assistance in the schools, making use of technology to enhance education. A number of online worksheets covering reading skills from kindergarten to grade six (k5learning.com) were analyzed, producing an average score of FRE 81.6. These findings correlate roughly with Flesch's original interpretation. When analyzed one by one, however, a different picture emerged. Only the second-grade worksheet yielded what Flesch would have considered elementary school difficulty (FRE 92.5)³. The others scored between FRE 54 and FRE 77, materials suitable for seventh- through twelfth-grade students. This means that either reading ability has advanced far beyond what Flesch envisioned nearly 75 years ago, or study materials today are far too difficult for elementary school pupils. Results of the intermediary study (Stewart, 2003) indicate that the latter is more likely to be true. This has been corroborated by others who have studied recent trends in online reading.

In an article entitled, "Lower-Literacy Users: Writing for a Broad Consumer Audience," Jakob Nielsen (2005) discusses making web sites more accessible to the masses. In this article, he estimates that 43% of the American public fall into a "lower-literacy" category of poor readers. In contrast with "higher-literacy" users, who scan texts on the Internet and pick out the pieces that interest them, these lower-literacy users "plow" the text, reading word for word and line by line. Nielsen recommends writing for lower-literacy users at the sixth-grade level (FRE 80), and writing for higher-literacy users at the eighth-grade level (FRE 70)⁴.

Understanding the Flesch readability scale in the Information Age requires combining elements of the twenty-first century occupational interpretation with social realities arising from the impact of computers in the workplace. At the easiest level (FRE 70-100) are materials commonly read for leisure by elementary, junior and senior high school students, who are society's *dependents*. Certain groups of adults may be added to this category – those who depend upon society for their support. An online application for food stamps (a social welfare program) rivaled Facebook in reading ease (FRE 70.3), or high school level, the threshold of readability for an applicant to be able to complete the form without assistance. Combined, we may thus consider social *dependents* as reading texts between FRE 70 and FRE 100.

A second group, whose readability scores would be in the range of FRE 60-70, may be considered socially *mobile*. This group might include some high school students, who are transitioning from a status of social dependency to one of self-sufficiency (i.e., *upwardly mobile*). Those blue-collar workers who are in the process of being replaced by automation, computerization, or globalization (i.e., *downwardly mobile*) might also fit into this group. A third group, those who are socially *established* (surviving blue-collar workers, white-collar workers,

professionals) commonly read texts between FRE 30 and FRE 60.

Those who read documents more difficult than FRE 30 could be considered the *elites* of society, for example, a statesman, a scientist, or an inventor. *U.N. Resolution 2225* (“Children and Armed Conflict,” 2015) has a readability score of FRE 8.6; all twenty-seven *U.S. Constitutional Amendments*, FRE 26.6. Twelve modern scientific articles that deal with quantum physics were evaluated, averaging FRE 25.2. Albert Einstein, whose 1905 paper “On the Electrodynamics of Moving Bodies” (“The Theory of Relativity”) was written at FRE 28.1, worked in the Swiss Patent Office. Documents filed in the U.S. Patent Office at about the same time include Nicola Tesla’s 1905 patent, “Art of Transmitting Electrical Energy Through the Natural Mediums,” which scored FRE 30.3, and the Wright Brothers’ 1906 patent, “Flying Machine,” which scored FRE 31.8. Abstracts of fifteen U.S. patents (2015-2016) scored FRE 23. Table 3 summarizes this interpretation.

Table 3. The Flesch Readability Scale, Reinterpreted for the Information Age.

Flesch Scale	Twentieth Century	Twenty-First Century	Information Age			Examples
90 - 100	Fifth – Sixth Grade	Elementary School	<div>↑ ↓</div> <div>Literacy</div>	Dependent	<i>The Giving Tree</i> (102)	
80 - 90		Junior High School			<i>Harry Potter</i> (83)	
70 - 80	Junior High School	High School		Mobile	Facebook (70) Welfare Appl. (70)	
60 - 70		Blue Collar			Tweets (63)	
50 - 60	High School	White Collar	<div>↑ ↓</div> <div>Higher-Literacy</div>	Established	Blogs, Emails (50-56)	
40 - 50	College	Professional			Games (49)	
30 - 40					Wikipedia (34)	
20 - 30	College Graduate	Statesman		Elite	Scientific Articles (25)	
10 - 20					Patents (23)	
0 - 10					Government Documents (1-26)	

CONCLUSION

The Flesch readability calculations began with a formula based on word length, in syllables, and sentence length, in words. This produced a readability score, which was then interpreted in terms of school grade levels.

In this study a different approach was taken. The examples were analyzed according to the *Flesch Readability Formula*, but instead of interpreting these scores in terms of school grade levels, the target audiences of the exemplary publications were considered. Five groups were identified, groups which corresponded to distinct ranges of difficulty on the Flesch Readability Scale: K-12 student, blue-collar worker, white-collar worker, professional, statesman. However, an occupational model only partially expresses the social realities of the Information Age.

Changing conditions in the workplace, caused by automation, computerization and globalization, require a

further shift in perspective from an occupational model to one of social functionality. In this model, four groups become evident. Socially *dependent* persons read at levels easier than FRE 70; socially *mobile* persons read at levels between FRE 60 and FRE 70; socially *established* persons read at levels between FRE 30 and FRE 60; those considered the *elites* of society read documents more difficult than FRE 30. While younger, emergent readers spend a greater portion of their time reading printed materials, the Information Age exerts increasing influence on older dependents, mobile persons, and the socially established. Elites will most likely transcend readability influences, whether technological or otherwise.

The twentieth century stood at the crossroads of the Industrial Age and the Technological Revolution, which ushered in the Information Age. One defining characteristic of the Information Age is accumulation, a principle of the desktop era. This accumulation is typified by Facebook, where one's identity is considered the sum of all the information that person has saved – text, photos, video, web pages. As mobile devices replace desktop computers, we now view digital identity differently. The accumulated “virtual self” is giving way to more spontaneous expressions, as in Instagram or Snapchat. Search engines eliminate the need for keeping vast libraries of information on hand. Changes in personal communication habits will, in time, necessitate a further study, examining whether the social functionality model of the Information Age remains a valid interpretation of readability in the Experience Age.

NOTES

- 1) In this system, some school districts offer middle school (a 5-3-4 system), and others offer junior high school (a 6-2-4 or a 6-3-3 system). High school begins in the ninth or tenth grade. The K-12 nomenclature conveniently describes any combination of elementary school, middle school / junior high school, and high school.
- 2) The *Preamble to the U.S. Constitution* has a readability score of FRE 1.13; the first sentences of the *U.S. Declaration of Independence*, FRE 1.32; *U.N. Resolution 1441* (“Weapons of Mass Destruction,” 2002), FRE 8.
- 3) The kindergarten worksheets probably would be read by the teacher, not by the pupils.
- 4) Using Flesch's original interpretation treats this evaluation very generously; a twenty-first century interpretation would place these figures at FRE 90 and FRE 80, respectively.

REFERENCES

Facebook. < <http://www.facebook.com/> > Accessed 15 Dec 2016.

Flesch, Rudolf (1949). *The Art of Readable Writing*. New York: Harper and Brothers. (1955). *Why Johnny Can't Read*. New York: Harper and Row.

Huffington Post. < <http://www.huffingtonpost.com/blogs> > Accessed 14 Jan 2017. K5 Learning. < <http://www.k5learning.com/free-worksheets-for-kids> > 14 Dec 2016.

Nielsen, Jakob (2005). “Lower-Literacy Users: Writing for a Broad Consumer Audience,” <<https://www.nngroup.com/articles/writing-for-lower-literacy-users/>> 21 Dec 2016.

Stewart, Jan E.J. (2003). “Recalibrating the Flesch Readability Index for the Twenty-first Century.” *Bulletin of the International Cultural Research Institute of Chikushi Jogakuen University / Junior College*, Number 14 (August, 2003). Available at <http://www.academia.edu>.

Twitter. < <https://www.twitter.com/realdonaldtrump> > Accessed 21 Dec 2016. United States, Pennsylvania, Supplemental Nutrition Assistance Program (SNAP). http://www.dhs.pa.gov/cs/groups/webcontent/documents/document/c_247418.pdf Accessed 21 Dec 2016.

WikiLeaks.org . “Hillary Clinton Email Archive.” < <https://www.wikileaks.org/clinton-emails/emailid/12241> > Accessed 21 Dec 2016.

Research into the Effect of Special Course with Positive Emotion about the Creative Design of Fuel-economizing Device on University Students' Creativity Development in the Department of Engineering

Shi-Jer LOU

National Pingtung University of Science and Technology, Taiwan

(lou@mail.npust.edu.tw)

Wei-Yuan DZAN

National Kaohsiung Marine University, Taiwan

Tsai-Feng CHENG

National Kaohsiung Normal University, Taiwan

Chih-Chao CHUNG

Kaomei Junior College of Health Care & Management, Taiwan

(Corresponding author) 9915916@gmail.com

ABSTRACT

This research aims to discuss the effect of special course with positive emotion about the creative design of fuel-economizing device on university students' creativity development in the Department of Engineering. This research took 45 students in the special course of the Department of Engineering in one National University of Technology located in the south of Taiwan and established a network learning platform with the positive emotion as the learning situation for the special course about the creative design of fuel-economizing device, so as to provide the space for the team students to discuss, share and integrate the creative design of fuel-economizing device; then the questionnaire survey was conducted to analyze and discuss the effect of positive emotional environment on university students' creativity development in the Department of Engineering. According to the research results, the following findings are made: 1) the construction of positive emotional environment contains 4 dimensions: pleasure, contentment, self-confidence and empathy; 2) university students in the Department of Engineering have a positive attitude towards the integration of the construction of positive emotional environment into special course; 3) most of the students are positive and affirmative of the integration of positive emotions into course teaching; 4) the construction of positive emotional environment has the significantly positive effect on university students' creativity development in the Department of Engineering. Finally, the specific suggestions are proposed, which will be used as the reference for the future promotion of positive emotion and creativity teaching.

Keywords: Fuel-economizing, Creativity, Positive Emotion, University Student

INTRODUCTION

In recent years, the rise of large-scale enterprises in America, such as Amazon, Apple, GOOGLE, and Facebook, lies in their courage to face challenge and pursuit of innovation. They lead a new wave of economic growth in the United States. This indicated that the educational focus on freedom, open thinking, and creativity of America had made substantial achievements (Wu, 2002). Thus, the education of creativity played a prominent role in education (Lubart, Georgsdottir & Besançon, 2009; Prabhu et al., 2008; Runco, 1996). "White Paper on the Education of Creativity" published by the Ministry of Education of Taiwan announced in 2007 mentioned that, it aimed to activate the creative potential of the whole people, improve the ability to solve issues, develop diversified skills, create and enrich self-value, and build Taiwan into a creative country.

However, it can be seen from the recent literature that intrinsic motivation played an important role in personal innovative behavior. The main factors influencing an individual's innovation lie in his/her intrinsic motivation which further affected innovation (Amabile, 1988). In other words, if an individual had high intrinsic motivation, he/she would exert the greatest power for creativity (Amabile & Conti, 1999). Besides, intrinsic motivation made one braver to explore new paths of cognition and happier to come up with new ideas (Amabile, Goldfarb & Brackfield, 1990). Therefore, the most decisive factor influencing an individual's creativity was psychological (Dewett, 2007).

In the field of psychological research, Panksepp (1998) argued that past studies focused primarily on the effects of negative mental state on physical and mental health. And few academic papers were about positive psychology. In terms of the rise of positive psychology, in Handbook of Positive Psychology, published by Oxford University in 2002, the topic in March 2001 was "positive psychology" (Snyder & Lopez, 2009). At present, the studies on "positive psychology" stress positive emotions, because positive emotions had better preventive effects than negative ones and could promote physical health (Salovey, Rothhman, Detweiler, & Seteward, 2000). Fredrickson (2001) advocated positive psychology and established broaden-and-build theory. Fredrickson explained that positive emotions like pleasure, interest, satisfaction, confidence, and love could promote brief thinking, action skills, and learning outcome.

Therefore, this study created positive emotions in the course of teaching and designed theme creative design competition. In the activity, students were expected to apply the basic knowledge and skills learned in textbook. Through the learning environment with positive emotions and the theme creative design competition, the potential creativity of students was stimulated. It was expected to combine both theory and practice. This study contained four purposes:

- (I) Exploring the dimension of the learning environment with positive emotions.
- (II) Exploring the dimension of the development of creativity.

(III) Exploring the impact of the integration of positive emotions into thematic courses for undergraduates majoring in Engineering Science.

(IV) Exploring the impact of positive emotions on the development of creativity of undergraduates majoring in Engineering Science.

LITERATURE REVIEW

2.1. Traits of creative personality

Kirton (1976) assumed that people with creative personality were interested in the changes in environment and brave to explore, had autonomy, endured vagueness, believed intuition, and stressed "originality". Chen (2012) summarized the traits of creative personality, including wisdom, originality, spirit of adventure, independence, curiosity, intuition, and strong sense of mission. In addition, much literature on creativity proposed that the generation of creativity was related to personal abilities, such as identifying problems, keen observation, insight, strain capacity, conversion, adaptability, skills of specific fields, professional skills, adjustment of oneself to meet the demands of environment, skills to solve problems, effective decision-making, and logical thinking (Donnelly, 1994; Feldhusen, 1995; Runco, 1996; Runco & Walberg, 1998; Sternberg & Lubert, 1996). Thus, this study aimed to cultivate students with the traits of creativity, such as initiative, originality, simplicity, imagination, knowledge, flexibility, and, association, and regarded these abilities as the basis for the design of questionnaire.

2.2 Positive emotion

Positive psychology emphasizes that psychology shall not only study the problems of human or society, but also the inner positive aspect and positive factors of humans. Hence, it suggests to actively promote positive thinking rather than passively preventing the consequence of negative factors. Seligman & Csikszentmihalyi (2000) explained positive psychology from three aspects, that is, positive emotions, positive individual traits, and positive institutions (Seligman & Csikszentmihalyi, 2014). Nevertheless, the research on positive emotions is still in the embryonic stage. Thus, different experts and scholars have different views on the definition of positive emotions. While defining positive emotions, this study referred to the definition proposed by Seligman who was an authority in positive psychology. Seligman classified positive emotions into three categories by different time phases, including past, present, and future. Negative emotions in a time point would make life unbalanced. Only by learning the skills to sustain happiness could one change his/her opinions on the past, cherish hope for the future, and experience the present. One should guide himself/herself toward positive emotions so as to maintain good psychological quality (Seligman, 2002; Peterson, Park & Seligman, 2013). This study summarized relevant literature on "positive emotions" like pleasure, contentment, confidence, and empathy which served as the key points to create an environment with positive emotions and the basis for the development of questionnaire.

RESEARCH DESIGN

Through the reference to and summary of relevant literature on positive emotions and creativity, this study had initial understanding of the integration of positive emotions into "CAD" thematic courses to develop the creativity of undergraduates majoring in Engineering Science and started to conduct relevant research design, described as follows:

3.1. Research Structure

This study designed "Course of Creative Design of Fuel-efficient Device" lasting for 9 weeks. The subjects were 48 sophomores of Engineering Science Department attending the thematic course. Experimental teaching method and questionnaire were employed to explore the influence of the "CAD" thematic course with positive emotion environment on their development of creativity, as shown in Figure 1. With respect to the creation of the environment with positive emotions, this study put forward four dimensions, including pleasure, contentment, confidence, and empathy, as the key points of creation of environment with positive emotions and the basis for questionnaire design. Furthermore, in regard to the development of creativity, it hoped that, through the design of "the thematic course of positive emotions", students could have the traits of creativity, including initiative, originality, simplicity, imagination, knowledge, flexibility, and, association which served as the basis of the design of creativity development questionnaire.

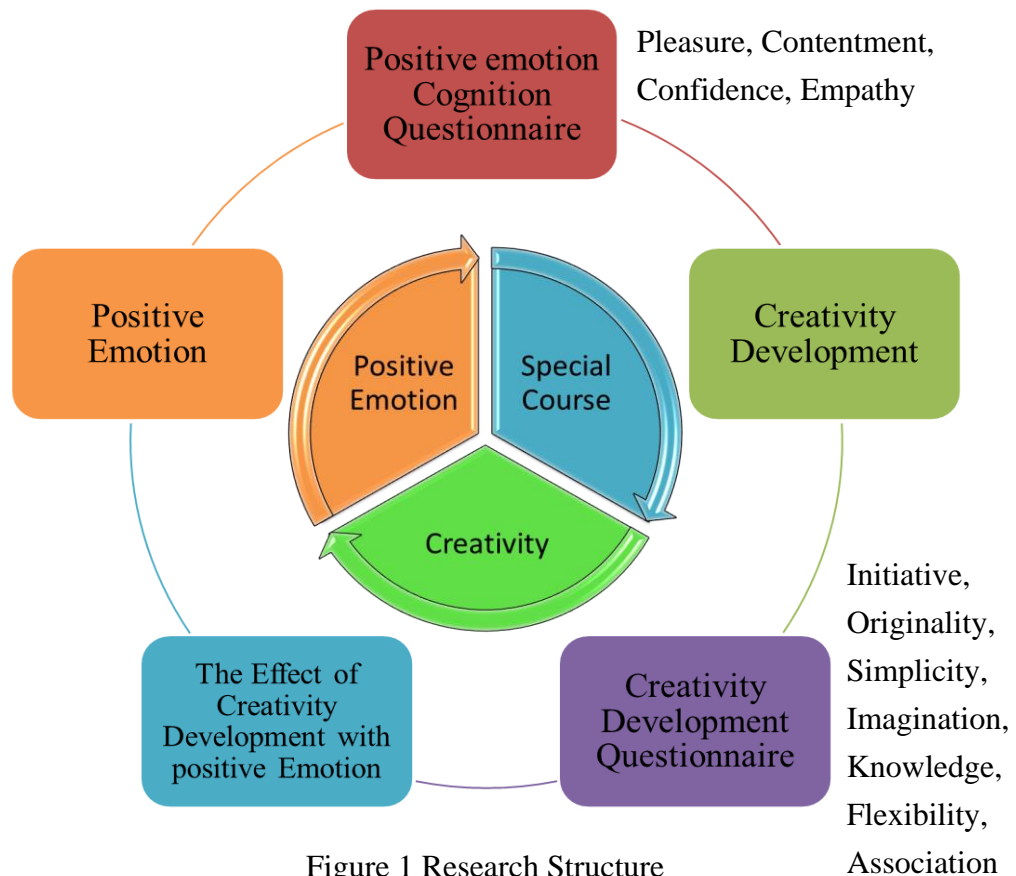


Figure 1 Research Structure

3.2. Research Tools

After the design of "positive emotion cognition questionnaire" and "creativity development questionnaire" was completed, this study invited two scholars to verify the validity, modified the questionnaires, and developed them into formal ones which were conducted with Likert five-point scale. After the pre-test of 100 undergraduates, it analyzed the questions, reliability, and validity, as follows:

3.2.1. Analysis of the pre-test of positive emotion cognition questionnaire

27% of the respondents with high scores and 27% of the respondents with low scores in valid questionnaire feedback were selected and classified into High Score Group (42 points) and Low Score Group (30 points). Based on the results of *t-test* of the independent samples, the questions in positive emotions questionnaire on pleasure, contentment, confidence, and empathy were at a significant level. And the correlation between each question and the dimension was over 0.3. Thus, it was not necessary to delete any questions. In terms of factor analysis, the KMO and Bartlett's spherical tests of pleasure (.893), contentment (.824), confidence (.868), and empathy (.857) were at a significant level. This showed that the questionnaire was suitable for factor analysis. Furthermore, the factor loading between each question and corresponding dimensions in the positive emotion questionnaire was high. Five questions in pleasure were between .716 and .894. Five questions in contentment

were between .675 and .886. Five questions in confidence were between .689 and .891. And five questions in confidence were between .667 and .889. The above data show that the factor loading of each dimension was greater than 0.5. Hence, all the questions should be retained. And the questionnaire had good validity. Lastly, in terms of reliability, the Cronbach's α values of pleasure (.837), contentment (.804), confidence (.898), and empathy (.873) were more than 0.7, implying that the reliability of each question was high. Additionally, the Cronbach's α of each dimension is between .827 and .943, representing that the reliability was favorable and isomorphism type. All the questions met requirements, so all of them were retained.

3.2.2. Analysis of the pre-test of creativity development questionnaire

Based on the t-test results of the independent samples of High Score Group (62 points) and Low Score Group (37 points), the questions on initiative, originality, simplicity, imagination, knowledge, flexibility, and association in creativity development questionnaire were at a significant level. And the correlation between each question and the dimension was over 0.3. Thus, it was not necessary to delete any questions. In terms of factor analysis, the KMO and Bartlett's spherical tests of initiative (.873), originality (.912), simplicity (.875), imagination (.892), knowledge (.881), flexibility (.849), and association (.878) were at a significant level. This showed that the questionnaire was suitable for factor analysis. Furthermore, the factor loading between each question and corresponding dimensions in the positive emotion questionnaire was high. Three questions in initiative were between .816 and .894. Three questions in originality were between .775 and .816. Two questions in simplicity were between .692 and .891. Two questions in imagination were between .696 and .876. Two questions in knowledge were between .715 and .843. Three questions in flexibility were between .659 and .781. And two questions in association were between .776 and .893. The above data show that the factor loading of each dimension was greater than 0.5. Hence, all the questions should be retained. And the questionnaire had good validity. Lastly, in terms of reliability, the Cronbach's α values of initiative (.843), originality (.932), simplicity (.867), imagination (.897), knowledge (.891), flexibility (.854), and association (.868) were more than 0.7, implying that the reliability of each question was high. Additionally, the Cronbach's α of each dimension is between .813 and .951, representing that the reliability was favorable and isomorphism type. All the questions met requirements, so all of them were retained.

RESULTS AND DISCUSSION

After 9 weeks of experimental teaching, and when the activity was completed, the respondents stated their own opinions. 48 copies of questionnaire had been distributed. And 48 valid copies were collected. The effective recovery rate was 100%. Statistical analysis was conducted with t-test of a single sample. This study explored the influence of "CAD" thematic course with environment with positive emotions on the development of creativity of undergraduates majoring in Engineering Science, as described below.

4.1. Analysis of positive emotion cognition questionnaire

In terms of the students' positive emotion cognition, the average score of each question was between 3.508 and 3.957 (The standard deviation was between 0.467 and 0.802), as shown in Table 1. The test value of 3 points was used for verification. The t value of each question was between 2.627 and 9.743, reaching a significant level and implying that most of the students gave positive feedback on the environment with positive emotions created. This study further analyzed the four dimensions of pleasure, contentment, confidence, and empathy, respectively, as follows:

4.1.1 Pleasure

In terms of the dimension of pleasure, the average score of each question was between 3.693 and 3.838 (The standard deviation was between 0.467 and 0.733), as shown in Table 1. The test value of 3 points was used for verification. The t value of each question was between 3.136 and 9.473, reaching a significant level. The top three questions with the highest scores were "This contest was good experience for me.", "I am glad to have participated in this contest.", and "I enjoy this contest." In light of the scores, the students gave positive feedback on the environment with positive emotions created. Hence, most of the students were satisfied and affirmative of the experience of participation in the contest, as well as design and course of the contest. The dimension of pleasure among positive emotions taught the students to cooperate and encourage with each other and see the pleasing side of the activity.

4.1.2 Contentment

With respect to the dimension of contentment, the average score of each question was between 3.528 and 3.750 (The standard deviation was between 0.594 and 0.794), as shown in Table 1. The test value of 3 points was used for verification. The t value of each question was between 6.318 and 9.743, reaching a significant level. The top three questions with the highest scores were "I expect that I can learn and grow in the contest.", "I think that the contest went smoothly.", and "I could not make it without the support of my teammates." In light of the scores, the students gave positive feedback on the environment with positive emotions created. Hence, most of the students were satisfied and affirmative of the contribution of mutual help among teammates to the success of the contest. The dimension of contentment among positive emotions allowed the students to sincerely thank the organizer for providing them with this chance to study and learn.

4.1.3. Confidence

In terms of the dimension of confidence, the average score of each question was between 3.508 and 3.901 (The standard deviation was between 0.536 and 0.802), as shown in Table 1. The test value of 3 points was used for verification.

The t value of each question was between 3.971 and 6.448, reaching a significant level. The top three questions with the highest scores were "My work meets my expectations.", "In the face of the unknown, I believe that I can do it.", and "I am very confident when I complete something by exerting all my efforts." In light of the scores, the students gave positive feedback on the environment with positive emotions created. Hence, most of the students were satisfied and affirmative of the creative works they designed. The dimension of confidence among positive emotions made the students to devote to explore the unknown, help their partners, overcome setbacks, and cherish the hope of success for anything.

4.1.4. Empathy

In terms of the dimension of empathy, the average score of each question was between 3.518 and 3.957 (The standard deviation was between 0.594 and 0.784), as shown in Table 1. The test value of 3 points was used for verification. The t value of each question was between 5.627 and 9.643, reaching a significant level. The top three questions with the highest scores were "After receiving the help from others, I am more willing to help others", "In the face of challenges, I persist with a positive attitude.", and "Recalling the contest, I am thankful to those who had helped me." In light of the scores, the students gave positive feedback on the environment with positive emotions created. Hence, most of the students, in the face of challenges, persisted with a positive attitude. The dimension of empathy among positive emotions made the students more willing to help others due to the help from others. They expressed gratitude to those who had helped them and cared about them.

Table 1 Analysis of t-test of single sample of positive emotion cognition

Dimension	Question	Verification Value		
		Average	Standard Deviation	T Value
Pleasure	I am glad to have participated in this contest.	3.693	.721	8.989***
	I am happy about the mutual help between my teammates and I	3.794	.648	3.136***
	I am glad when my teammates praise me	3.765	.467	6.318***
	This contest was good experience for me.	3.838	.691	9.473***
	I enjoy this contest.	3.681	.733	7.441***
Contentment	I think that the contest went smoothly.	3.750	.717	9.671***
	I expect that I can learn and grow in the contest.	3.530	.594	9.743***
	I am touched when my teammates help me	3.657	.738	6.318***
	I could not make it without the support of my teammates.	3.530	.794	9.463***

	I'd like to thank the organizer for holding this activity	3.528	.740	7.441***
Confidence	I am very confident when I complete something by exerting all my efforts.	3.901	.675	5.233***
	In the face of the unknown, I believe that I can do it.	3.578	.802	5.844***
	During the contest, I supported my teammates and believe that we could overcome the difficulties	3.508	.536	4.818***
	I think that I have a chance to succeed in anything	3.625	.702	3.971***
	My work meets my expectations.	3.623	.724	6.448***
Empathy	I'd like to thank those who cared about me	3.735	.781	5.627***
	After receiving the help from others, I am more willing to help others.	3.530	.754	9.643***
	I am touched when my friends consoled me when I was sad	3.957	.784	6.318***
	In the face of challenges, I persist with a positive attitude.	3.530	.594	9.473***
	Recalling the contest, I am thankful to those who had helped me.	3.518	.724	7.441***

4.2. Analysis of creativity development questionnaire

As shown in Table 2, in regard to development of creativity, the average of each dimension was between 3.701 and 3.991. The standard deviation was between 0.624 to 0.933, indicating that most of the students were affirmative of their development of creativity. In the t-test analysis of single sample with the verification value of 3, the t value of each dimension was between 6.448 and 9.143, reaching a significant level. The top three dimensions with the highest scores were "flexibility (M=3.991)", "simplicity (M=3.942)", and "association (M=3.843)", in order. Additionally, "originality" had the lowest score yet with the score of recognition of 3.701 points. The observation of the scores showed that the students held a positive and affirmative attitude toward the influence of positive emotions on their development of creativity. After the course and the activity, most of the students no longer focused on form, but could flexibly adapt to any conditions. They learned to think out of restrictions and from various perspectives, and use new concepts to solve problems. Moreover, under the guidance of environment with positive emotions, the students learned to think and solve complicated matters, and they were confident in and proud of their abilities. Besides, the students agreed the cultivation of creativity stimulation and creative thinking skills.

Table 2 Analysis of t-test of single sample of development of creativity

Dimension	Average	Standard Deviation	t
Initiative	3.735	.933	6.448***
Originality	3.701	.846	7.262***
Simplicity	3.942	.836	6.448***
Imagination	3.815	.781	8.818***
Knowledge	3.761	.748	7.971***
Flexibility	3.991	.624	9.143***
Association	3.843	.892	8.989***

4.3. Analysis of the concept of creative design of the students' works

The statistical analysis of this study shows that most of the students hold a positive attitude towards the environment with positive emotions created by this study and agree with the dimensions of development of creativity. Hence, this study analyzed the creative design concept of students in their works with the skills learned from "CAD design course", and learned the influence of environment with positive emotions on their development of creativity.

This study integrated positive emotions into course and activity design, requested teachers to often encourage students, and adopt positive and active guidance methods so that the students would learn with pleasure and confidence and be willing to spend time in study and activity. In order to complete the design of energy-efficient device, the students spent much time in collecting the data related to energy conservation, had relevant discussions, and used CAD software jointly to complete the blueprint, as shown in Figure 2. Students of the first group drew the draft of a streamlined sports car. Carbon fiber material was planned to be used to reduce the weight of the car and achieve the purpose of saving oil. Furthermore, based on data collection, they learned that cascade gas-electric hybrid system could effectively save fuel consumption, so they applied it to the design and planning of the engine. In addition, on the discharge valve of the engine, an air control valve was added and controlled by a high-precision electronic controller. So that complete combustion could be achieved in the combustion chamber and improve fuel efficiency, as shown in Figures 3 and 4. The students of the second group employed the skills learned at the CAD design course to draw "green energy yacht". The streamlined interior design reduced the weight of the yacht. And the stream-lined shell reduced wind resistance to save oil. Moreover, solar panel was adopted on the shell, which could convert solar energy into electrical and kinetic energy in order to drive the yacht and achieve the goal of replacement of limited energy by sustainable and green energy, as shown in Figure 5.

The students of the third group not only added solar panel (black) on the top of control cabin to collect solar energy, but also added sail design to convert wind energy into kinetic or electrical energy so as to add to the power of the ship and save fuel.

To sum up, the above-mentioned fuel-related knowledge was summarized by the students after information collection and group discussions. This design activity made the students happy to learn and stimulated their motivation to actively learn. Besides, most of the students believed that, different opinions existed during discussions. Due to the positive emotions created by the teacher and their empathy, the students could embrace different opinions, reach consensus finally, solve problems together, and complete the creative design of fuel-efficient device.

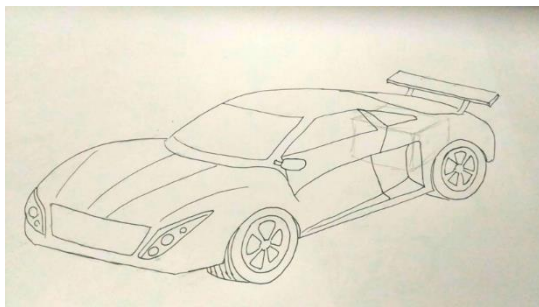


Figure 2 Draft of the streamlined sports car

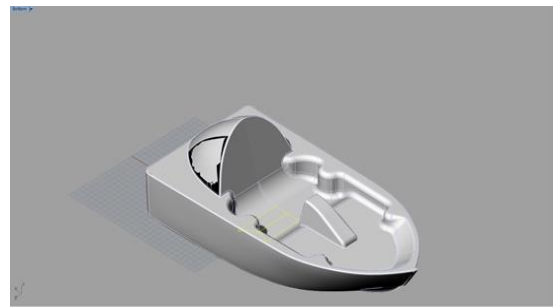


Figure 3 Blueprint of the green energy yacht

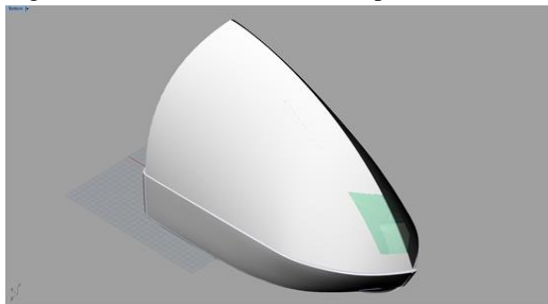


Figure 4 The solar power shell of the green energy yacht

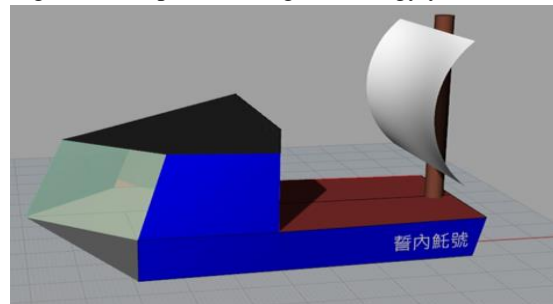


Figure 5 Ship fueled by wind and solar power

CONCLUSION AND SUGGESTIONS

5.1 Conclusion

After the above discussion and research analysis, this study reached the following six conclusions:

- (1) The creation of learning environment with positive emotions contained four dimensions, namely, pleasure, contentment, confidence, and empathy.

Through literature review, and summarization and analysis of the results of pre-tests of questionnaires, this study concluded that the creation of learning environment with positive emotions contained four dimensions, namely, pleasure, contentment, confidence, and empathy. Hence, it developed the four dimensions of positive emotions into a positive emotion cognition questionnaire, and integrated the into course teaching and activity design to create learning environment with positive emotions.

- (2) Development of creativity covered seven dimensions, that is, initiative, originality, simplicity, imagination, knowledge, flexibility, and association.

Through literature review, and summarization and analysis of the results of pre-tests of questionnaires, this study concluded that the development of creativity covered seven dimensions, that is, initiative, originality, simplicity, imagination, knowledge, flexibility, and association. Thus, it developed the seven dimensions of development of creativity into a creativity development questionnaire to verify the influence of the integration of positive emotions into course teaching on development of creativity.

- (3) Most of the students are positive and affirmative of the integration of positive emotions into course teaching. The statistical analysis of positive emotion cognition questionnaire in this study indicates that, after the course and contest, most of the undergraduates majoring in Engineering Science gave positive feedback on the environment with positive emotions created. And they were positive and affirmative of the integration of positive emotions like pleasure, contentment, confidence, and empathy into course teaching which had significant differences and were effective to make the students to study happily.

- (4) The integration of positive emotions into the course has a positive and significant influence on the development of creativity of most of the students.

The statistical analysis of creativity development questionnaire in this study indicates that, after the integration of positive emotions into the course and contest, the dimensions of development of creativity, including initiative, originality, simplicity, imagination, knowledge, flexibility, and association exerted significant and positive influences, implying that the integration of positive emotions into course teaching is conducive for the development of creativity of the undergraduates majoring in Engineering Science.

5.2 Suggestions

In view of the conclusions, this study proposed the following suggestions in the aspects of school, teacher, and future research when one intends to promote the integration of positive emotions into course teaching and development of creativity.

- (1) School: Promoting the integration of positive emotions into course teaching

This study finds that most of the students are affirmative and positive about the integration of positive emotions into course teaching. As the Internet and other media are filled with negative news, it is suggested to transmit more positive energy to students, integrate positive emotions into courses, and provide a learning environment with positive emotions to students.

- (2) Teacher: Improving the quality of positive emotions and enhancing the role of tutor

The study discovers that the integration of positive emotions into course teaching exerts a positive influence on the development of creativity of most of the students. Therefore, it is suggested that students can enhance their quality of positive emotions and skills of creativity, facilitate students to learn in an environment with positive emotions, and guide students to develop their creativity potential.

(3) Future research: Using experimental research to carry out long-term follow-up study

This study, based on experimental teaching of an individual case, shows that the integration of positive emotions into course teaching exerts a positive influence on the development of creativity of most of the students. Future researches can design control group and adopt experimental research method to conduct teaching research, further explore the achievements of students in creativity development, serve as important reference for the promotion of integration of positive emotions into course teaching in the future.

REFERENCE

- Amabile, T. M. (1988). A model of creativity and innovation in organization. *Research in organizational behavior*, 10, 123-167.
- Amabile, T. M., & Conti, R. (1999). Changes in the work organization for creativity during downsizing. *Academy of Management Journal*, 42(6), 630-640.
- Amabile, T. M., Goldfarb, P., & Brackfield, S. C. (1990). Social influences on creativity: Evaluation, coaction, and surveillance. *Creativity Research Journal*, 3(1), 6-21.
- Chen, K. K. (2012). Organizing creativity: enabling creative output, process, and organizing practices. *Sociology Compass*, 6(8), 624-643.
- Dewett, T. (2007). Linking intrinsic motivation, risk taking, and employee creativity in an R&D environment. *R and D Management*, 37(3), 197-208.
- Donnelly, B. (1994). Creativity in the workplace. *The Journal of Technology Studies*, 20(2), 4-7.
- Feldhusen, I. F. (1995). Creativity: A knowledge base, meta cognitive skill, and personality factors. *Journal of Creative Behavior*, 29(4), 255-268.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology. *American psychologist*, 56(3), 218-226.
- Kirton, M. (1976). Adaptors and innovators: A description and measure. *Journal of Applied Psychology*, 61(5), 622-629.
- Kuo, S. C. (2010). The Meaning of Positive Psychology and It's Application In Learning. *Journal of Ming Chuan Education*, 2, 56-72.
- Lubart, T., Georgsdottir, A. & Besançon, M. (2009). The nature of creative giftedness and talent. *Educational & Child Psychology*, Vol. 30 No.2, 79-88.
- Panksepp, J. (1998). Attention deficit hyperactivity disorders, psychostimulants, and intolerance of childhood playfulness: A tragedy in the making?. *Current Directions in Psychological Science*, 7(3), 91-98.
- Peterson, C., Park, N., & Seligman, M. E. (2013). Orientations to happiness and life satisfaction: The full life versus the empty life. In *the exploration of happiness* (pp. 161-173). Springer Netherlands.
- Prabhu, V., Sutton, C. & Sauser, W. (2008). Creativity and certain personality traits: Understanding the mediating effect of intrinsic motivation. *Creativity Research Journal*, 20(1), 53-66.
- Runco, M. A. & Walberg, H. J. (1998). Personal explicit theories of creativity. *The Journal of Creative Behavior*, 32(1), 1-17.
- Runco, M. A. (1996). Personal creativity: Definition and developmental Issues. *New Directions for Child Development*, 72, 3-30.
- Runco, M. A. (1996). Personal creativity: Definition and developmental Issues. *New Directions for Child Development*, 72, 3-30.
- Salovey, P., Rothmman, AJ, Detweiler, JB, & Seteward, WT (2000). Emotonal states and physical health. *American Psychologist*, 55, 110-121.
- Seligman, M. E. (2002). Positive psychology, positive prevention, and positive therapy. *Handbook of positive psychology*, 2, 3-12.
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Special issue on happiness, excellence, and optimal human functioning. *American Psychologist*, 55(1), 5-183.
- Seligman, M. E., & Csikszentmihalyi, M. (2014). Positive psychology: An introduction. In *Flow and the foundations of positive psychology* (pp. 279-298). Springer Netherlands.

- Snyder, C. R., & Lopez, S. J. (Eds.). (2009). *Oxford handbook of positive psychology*. Oxford University Press, USA.
- Sternberg, R. J. & Lubart, T. I. (1996). *Defying the crowd: Cultivating creativity in a culture of conformity*. NY: Free press.
- Wu, C. C. (2002). *International Development and Trends in Creativity Education*. Ministry of Education: White Paper on Creative Education-Establishing a Republic of Creativity (R. O. C.) for Taiwan, Taiwan.
- Wu, M. L. (2012). *SPSS Statistical Application Learning Practice: Questionnaire Analysis and Application Statistics*. Wu-Nan Book Inc., Taiwan.

Rise and Fall of Massive Open Online Courses: Implications of Limitations in Teaching and Evaluation Processes

Prof. Dr. Stephen John BEAUMONT

Centro de Tecnología para el Desarrollo (CENTED)

Buenos Aires, Argentina

info@cented.org

ABSTRACT

In the particular case of e-learning pedagogical processes, we can find a wide range of educational methodologies, from automated to personalized ones. One example is the peer review methodology, where each participant in a virtual course, to complete the assessment of each module should evaluate at least a determined number of works from their peers. This methodology is popular in one particular scenario which is not present (at least in equal dimensions) in classroom teaching processes. This is the possibility of including, within one particular course, an enormous number of participants which would be impossible even to imagine in a classroom teaching process. This is where the concept of “mass education” appears, and with it, the concept of Massive Open Online Courses (MOOCs). On the other hand, we can see the results of personalized methodologies, in which the main instructor or a coordinator or assistant interacts directly with each student and performs feedback on each of the work, inquiries or suggestions from them.

Keywords: Massive Open Online Courses, e-learning, mass education, peer review methodology

INTRODUCTION

The key factor in any course implementation is the didactic design. Choosing the appropriate content, structuring it properly and communicating effectively, form the basis upon which we can implement a successful learning process. In this context, we are constantly reflecting on questions such as: What should a student know and what would be convenient for them to know?, How do we choose the priority issues?, In what way should they be taught?, What duration and intensity must the education process have?, How do we evaluate the outcome of this learning?, etc.

Given these concerns, both from the point of view of the teacher as from the student, there is a need to analyze the entire educational process and identify the critical components that not only should not be absent, but must be optimized to achieve greater efficiency and effectiveness thereof. Education is a process of systematically and intentionally directed communication toward achieving goals previously set or adjusted on the fly and whose essential components are: the person who must be educated, the educator, the message, the educational environment and the numerous interactions between these different factors. (De Ketele, 1984)

To plan a teaching program, the first thing we have to be clear about is their objective, which defines the criteria used to select the material, design the program content, the teaching procedures and the development of tests and examinations. The questions that arise are basically: Where do these objectives come from?, How do we set them?, What are the sources we use to define these objectives? Tyler argues that there is no single source, but each one has certain values and all of them must be considered when designing a comprehensive educational program. (Tyler, 1974)

THE EDUCATIONAL PROCESS

As a result of the above steps, one can select a list of important and achievable goals, which, as they come from various sources, may be stated in different ways. When planning a single list of important objectives, it is convenient to list them in ways that are useful to be able to select learning activities and also guide these. Since the real purpose of education is not that the instructor performs certain tasks, but instead to promote significant changes in patterns of student behaviour, it is important to recognize that every statement of objectives will be related to the changes experienced by the students.

Meanwhile, Stenhouse argues that there are two ways to view the curriculum, the first one is to consider it as an intention, plan, or limitation on what we want to happen; the other idea is to see it as the state of things that really happen. Therefore, he clarifies that the study of the curriculum must be concerned with the relationship between the intention that this curriculum actually has and the reality of its implementation. After all, the curriculum is what happens in real situations. It is not the hope, but the achievement. The problem when one specifies it is to accurately perceive, understand and describe what actually happens. (Stenhouse, 1987)

The curriculum should, at least, provide the basis for planning a course, study it and justify it empirically. The most important principles that must be respected are:

- Selection of content: what should be taught and learned.
- Development of a teaching strategy: how must this be taught and learned.
- Decision-making on the sequence of events.
- Diagnosis of strengths and weaknesses of each student and their possibility to adjust to various cases.
- Study and evaluation of progress of both students and teachers.

Chevallard states that any social teaching and learning project is built dialectically by means of the identification and designation of contents. A content knowledge that has been designated as knowledge to be taught, then suffers a set of changes that will make it suitable to occupy a place among the objects of education. (Chevallard, 1997)

The experts who develop a curriculum become the mediators between scholarly knowledge and knowledge to be taught. Thus the curriculum becomes a bridge between theory and action, even more so if it allows freedom to both teachers and students.

Having selected the content, one must also choose appropriate teaching strategies to achieve the desired goal. Designing teaching situations takes into account the assumptions concerning both teaching and learning. According to Fenstermacher and Soltis, there are three approaches to teaching, regarding how the teacher is conceived:

- The executive approach sees the teacher as an executor, a person responsible for producing some learning, and to achieve this uses the best skills and techniques available.
- The therapist's approach sees the teacher as an empathic person responsible for helping each individual in their personal growth and achieving a high level of assertiveness, understanding and acceptance.
- The liberating approach sees the teacher as a liberator of the individual's mind and a promoter of moral, rational and integral human beings. (Fenstermacher y Soltis, 1999)

According to Brunner, students can be classified as:

- Imitative apprentice: The students aim to achieve specific goals by steps or procedures.
- Didactic exposure apprentice: The student constitutes himself as a receptacle of knowledge.
- Thinker apprentice: There are exchanges among peers and the student expresses previous knowledge, but without theoretical support.
- Apprentice as objective knower: The student performs exchange, but with theoretical support (he must give valid theoretical arguments).

The way to propose the class depends on how the learner is considered, according to the content, the student group and the moment. The concepts of learner are dynamic and complementary, not exclusive. (Bruner, 2001)

In defining and prioritizing certain facets of a topic and providing those meanings to be promoted, the teacher anticipates the general context in which this process will develop, plans sequences of work, studies different ways to combine tasks, etc. This outline is precisely the adoption of a strategy: a plan that allows us to attain predefined goals. Stenhouse defines this plan by saying: Teaching strategy seems to refer more to the planning of teaching and learning based on principles and give greater importance to teacher judgement. It involves the development and implementation of a course of conduct. (Stenhouse, 1987)

In the case of e-learning pedagogical processes, there is one particular scenario which is not present (at least in equal dimensions) in classroom teaching processes. This is the possibility of including, within one particular course, an enormous number of participants which would be impossible even to imagine in a classroom teaching process. This is where the concept of “mass education” appears, and with it, the concept of Massive Open Online Courses (MOOCs). These methodologies of “mass education” may seem very attractive because of the volume of students who can be trained, but are very sensitive to environmental design, which can determine the success or failure of the process. On the other hand, we can see the results of personalized methodologies, in which the main instructor or a coordinator or assistant interacts directly with each student and performs feedback on each of the work, inquiries or suggestions from them. (Beaumont, 2016)

E-EVALUATION IN VIRTUAL ENVIRONMENTS: AUTOMATED VERSUS PERSONALIZED METHODOLOGIES

In e-learning pedagogical processes we can find a wide range of educational methodologies, from automated to personalized ones. One example is the peer review methodology, where each participant in a virtual course, to complete the assessment of each module should evaluate at least a determined number of works from their peers. To illustrate this, I would like to use as an example a course dictated on the Novo Ed virtual platform; in particular I will refer to a course from 2013, by Stanford University in conjunction with the Catholic University of Chile, on "Evaluation of Strategic Decisions."

Since this course was based on the MOOC model of mass formation and an enormous amount of participants were likely (as the course was free and recognized by prestigious institutions), it resulted impossible to perform a personalized assessment of each students work. According to the organizers, "the inscriptions of this course exceeded 118,000 students." Obviously, with one teacher in charge, having to read about 4 or 5 answers of each participant was directly an impossible task. As a solution, they implemented the peer review methodology, in which each participant should assess at least 5 papers from their peers in order to complete each module

It sounded good in theory but in practice it was not that simple.

The main difficulties arose in the heterogeneity of academic backgrounds of participants and the large difference in the depth that they engaged in both developing responses as making assessments on them. The first problem that arose was that of cases of highly elaborate answers, several pages long and with great academic quality, which were evaluated as mediocre, without even an argument or some sort of explanation justifying this evaluation. Just a "low grade" without taking the time to write 5 words in the comment field explaining this evaluation.

This obviously created a huge amount of claims and complaints from participants, which, added to the limited availability of coordinators or assistants, generated a major frustration among most of the students.

On the other hand, we see the result of personalized evaluation methodologies, where the main teacher, or a reduced group of coordinators or assistants, read the work of each student and makes a written feedback on each piece of work. The immediate and most obvious advantage to students is that they feel more accompanied and enriched in their learning process. A disadvantage, however, is the fact that this methodology requires more teacher effort. Returning to the previous example, it would be impossible to assess in a personalized way 118,000 pupils in 4 months!

Finally, having developed these strategies, feedback is crucial to achieve the educational process to create a system of continuous improvement in its implementation. For this you must have an appropriate system of assessment of learning.

As in any successful educational processes, feedback from the participants plays an important role to improve different aspects such as curricular design, methodology, evaluation, etc. One issue that has frequently arisen is the issue of the impact of latest trending technology on our educational process design.

As well as taking note of spontaneous feedback from online students Centro de Tecnología para el Desarrollo (CENTED) has conducted a number of surveys among these participants, so as to understand their particular needs as far as learning environments and the use of information technology in their homes and or work-places. The main results from the latest survey (CENTED, 2015), include:

- One of the most frequent complaints from online students is the availability of tutors /coordinators to be able to answer inquiries and assist students in general problems.
- Delay in answering (both questions and evaluation of exercises) and depth of responses are cited in second place.
- Another issue occurring in some highly automated e-learning platforms is that some students find it difficult to locate the learning material. When there are many different files (video, text, presentations, etc.) located in different places, it is relatively frequent that they "skip" some of them.

CONCLUSION

One of the main issues in today's on line education programmes is trying to find the right balance between the amount of students and the amount of teachers or coordinators assigned to each particular course. The main problem is the cost of this. How can you offer free MOOCs to thousands of students when you should probably have to pay for a couple of hundred teachers or coordinators?

Obviously there is much more to say about the subject and is always open to debate, but the contrast between models with less teacher involvement versus those that require greater dedication, pose significant challenges when designing a virtual teaching process.

We can summarize the dilemma as “automation versus customization.”

REFERENCES

- Beaumont, Stephen. 2016. “E-Teaching Strategies: Massive Versus Customized Methodologies.” The Turkish Online Journal of Educational Technology - TOJET (ISSN 2146-7242). November 2016. pp 749-753.
- Bruner, J. 2001. “Desarrollo cognitivo y educación.” Madrid, Morata.
- CENTED. 2015. “Relevamiento del uso de tecnología de la información entre alumnos de cursos virtuales.” Documento interno.
- De Ketele, J. M. 1984 “Observar para educar.” Visor.
- Fenstermacher, G. 1989. “Tres aspectos de la filosofía de la investigación sobre la enseñanza,” en Wittrock, Merlin “La investigación de la enseñanza I, Enfoques, teorías y métodos.” Barcelona, Paidós/MEC.
- Fenstermacher, G. y Soltis, J. 1999. “Enfoques de la enseñanza.” Amorrortu, B. Aires.”
- Stenhouse, L. 1987. “Investigación y desarrollo del curriculum.” Madrid, Morata. Tyler, R. 1974. “Principios para la elaboración del currículo.” Troquel.

Safelabs the Safe Education and Internet Surfing in Computer Labs for People with Intellectual Disability

Ana Luísa Mateus Oliveira CHANÇA TORRES

*Escola Superior de Educação
Instituto Politécnico de Santarém
Portugal
ana.torres@ese.ipsantarem.pt*

Sérgio COELHO

*Agrupamento de Escolas Alexandre Herculano
Portugal
sergioleal.coelho@gmail.com*

José Maurício DIAS

*Escola Superior de Educação
Instituto Politécnico de Santarém
Portugal
jose.mauricio@ese.ipsantarem.pt*

Anna KWIATKOWSKA

*Polish Association for Persons with Intellectual Disability
Poland
webmaster@psoni.org.pl*

ABSTRACT

Persons with intellectual disability become less and less digitally excluded but this development brings also new problems – problems related with safety. And it's not just about surfer's security in internet. Also, arises a problem of safe behaving in computer labs. Support is expected for both, leaders of computer labs and labs users with intellectual disability. These needs can be fulfilled by the project "Safe Education and Internet Surfing in Computer Labs for People with Intellectual Disability" called shortly SafeLabs. The project is financed from Erasmus + Program, action KA2 – Adult Education, Strategic Partnership and has been started in autumn 2015 by the Polish Association for Persons with Intellectual Disability. The partnership was built around the idea of safe behaving in computer or multimedia laboratories. The other partners of the project are Socialas Inovacijas Centrs from Latvia, Spolecnost pro podporu lidi s mentalnim postizenim v Ceske Republice from Czech Republic and Instituto Politecnico de Santarém from Portugal.

The project idea was to define the dangers of work not only in internet but also in computer environment used by people with intellectual disability. Together with dangers and risks list, the answers and solutions were worked out. All this knowledge is now accessible in form of database, where labs leaders and staff can find information. The certification rules were worked out and SafeLabs certificates were granted to the laboratories which met the certification requirements. These labs could be named as safe computer lab for persons with intellectual disability.

Keywords:Persons with intellectual disability; Safe computer labs; Cyber safety.

INTRODUCTION

Today's world is based on the internet and social media. People with intellectual disability also use the Internet in a more and more common and sophisticated way. They are encouraged to this, because thanks to digital inclusion they can become full citizens and does not stand in the worse position when looking for work.

Internet, due to its universality and accessibility, however, carries many risks. Cyber violence and the antidote of cyber safety are fast becoming a global concern for governments, educational authorities, teachers, parents and users.

Some aspects of internet endanger safety of all – children, teenagers, adults and seniors, regardless of whether they are people with or without intellectual disabilities. But it can be concluded that people with intellectual disabilities are more vulnerable to various types of fraud and cyberbullying.

Because of limited funds of public centers for people with disability, staff leading computer labs are often therapists, who are left alone, with no IT support and sometimes they have no skill to solve problems they meet during their everyday work. Sometimes they are not even conscious of the problems.

It is based on these needs that the Safe Education and Internet Surfing in Computer Labs for People with Intellectual Disability project (SafeLabs) comes out and it is financed from the Erasmus+ Programme action KA2 Strategic Partnerships for adult education, Cooperation for innovation and the exchange of good practices. The partnership was built by 4 organizations and institutions: Polish Association for Persons with Intellectual Disability (Poland) – coordinator; Instituto Politécnico de Santarém (Portugal); Společnost pro podporu lidí s mentálním postižením v České republice (Czechia) and Social innovation centre (Latvia).

The main goal of the project is to help computer laboratories leaders to create a safe place for persons with intellectual disability to work in a common space of computers and internet. The second project aim is to deliver materials for teachers, therapists, parents and persons with intellectual disability, as well as informing about possible dangers during work in computer laboratories and in internet and proposing suitable solutions.

So, as it was mentioned above, the project's results and activities are addressed to three main groups of recipients:

1. teachers, therapists, trainers - educators of adult persons with intellectual disability;
2. parents whose adult children are persons with intellectual disability;
3. persons with intellectual disability.

During the two year, partners created and published several project intellectual outputs. All the worked-out materials can be find on the project website, figure 1 <http://www.safelabs.eu>, in five languages: English, Portuguese, Polish, Latvian and Czech.

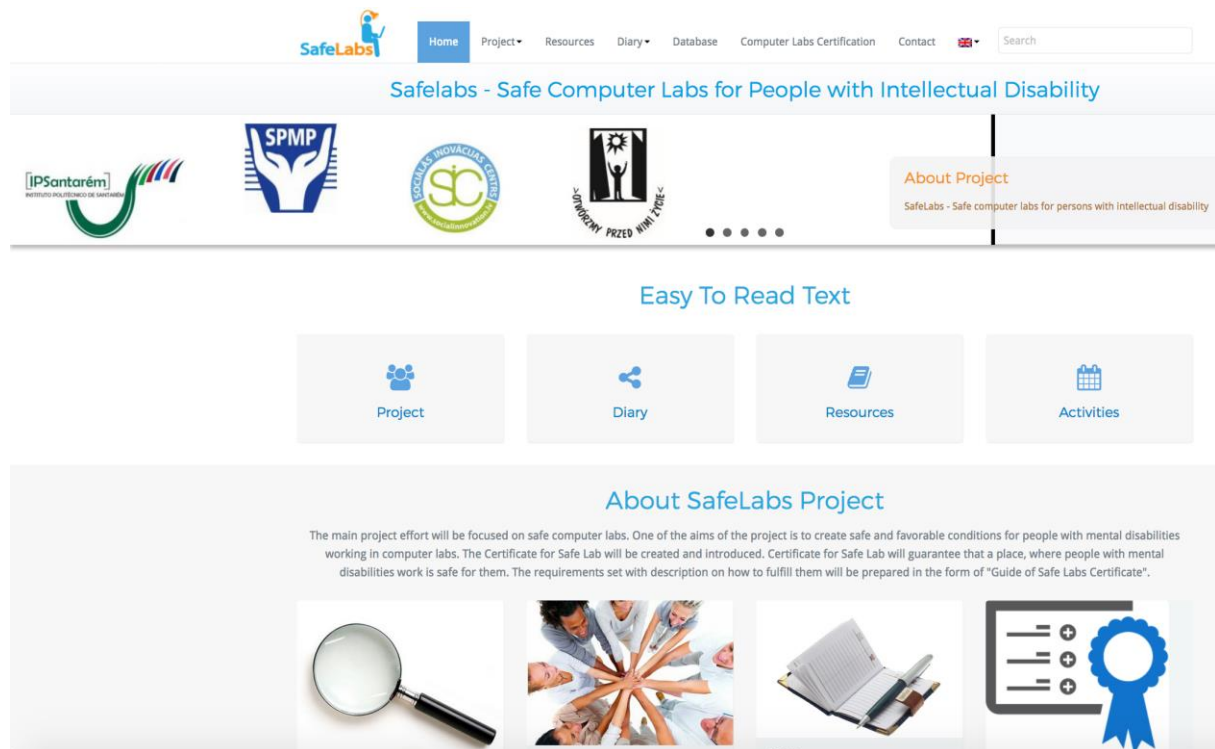


Figure 1 – SafeLabs project Website

THE RESEARCH

The research aimed was to find the needs and problems that persons with intellectual disability face while using internet and working in computer labs. The idea was to define the dangers of work not only in internet but also in computer environment. The partners searched about internet dangers and on the organization of safe computer labs with special focus on persons with intellectual disability. Together with dangers and risks list the answers and solutions were worked out. Partners analysed existing skills to identify internet and computer dangers and ways to avoid or solve them. Partners did resources research and summarized the results. The next step in researches were interviews with stakeholders. The face to face meeting with teachers, trainers, special educators and persons with intellectual disability were organized. Simultaneously the discussion in social media was conducted. Partners worked on the questions to be asked to persons with disability and to computer or multimedia labs leaders. The aim of these interviews was to find out the problems computer and internet users facing, how they solve them and what are their knowledge about internet dangers. The discussion plan was created and the discussion was held, mainly in Facebook, but in some cases via paper polls or during meetings. Questions addressed to persons with intellectual disability were in form of easy to read text. Data was collected from over 120 respondents.

The main conclusions of the research were:

Individuals who are supporting people with disabilities know about the risks linked to the used Internet and many of them believe that the risk situations are the same for people without disabilities and for people with intellectual disabilities. Nevertheless, the existence of a greater vulnerability to manipulation was pointed. Several risk situations have been described by respondents who reported about dating portals, porn pages, Facebook, loans possibility on internet etc. They share the concern that for people with disabilities it can be difficult to identify some risks or risky behaviours on Internet. People with intellectual disabilities are aware of the information they should never publish on Internet and, interestingly, they list the same information as those who support people with disabilities. When a person with a disability faces a problem on Internet, it is important for many of them to turn to somebody they trust but who doesn't know their parents. Many people with disabilities are afraid that their parents would block their access to their computers. It was also complicated to explain to people with disabilities what is bullying, especially cyber bullying. There was an interesting answer, one woman with intellectual disability who says that: "only a bad person can bully" and her answer to the question: "How can you identify a bad person", she answered: "Every person who doesn't have an animal". Teachers stressed the need to professional equipment computer laboratories in all relevant areas (electrical safety, system configuration, ergonomic etc.).

The close cooperation with parents were also mentioned during meetings. This survey therefore shows the importance of developing further work in this area. It is highly needed to train people with intellectual disabilities so that will know the safety rules and know how to safely behave on Internet. From the technical point of view, computer protection and appropriated set-up are also necessary to surf safely on the net.

FINDINGS

Results of resources research, discussion details and conclusions were collected and published in the digital publication "Review of Available Knowledge on Internet and Computer Dangers in Laboratories for Persons with Intellectual Disability", figure 2 - <http://safelabs.eu/en/resources/>.

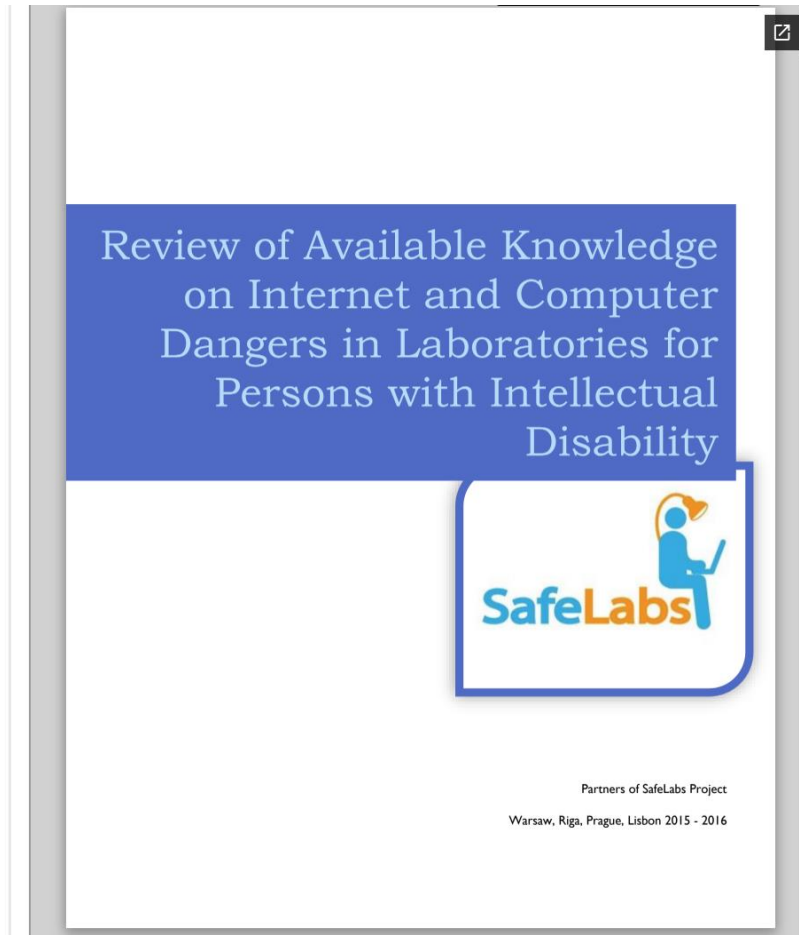


Figure 2 - Digital publication

After collecting and analyse the information, partners designed and implemented database with rules, figure 3 - <http://safelabs.eu/en/database/>. The rules concern following issues: how to be safe in internet, in computer labs, how to prepare computers and internet in labs or how to recognize that a person with intellectual disability suffers any problem caused using the computer, internet, social media etc. The database users can be teachers, psychologists, parents and persons with intellectual disability. The interface of the database rules has a filter, so user can limit rules list only to rules addressed to specific type of receiver. Also, the search engine is implemented and all the database can be searched by given categories or by any phrase. The knowledge collected in the database is unique and it is presented in attractive way. There are not only plain articles, but also articles with easy to read text, PowToon films, multiply choice tests and other forms. The database is open. The logged users can add new rules.

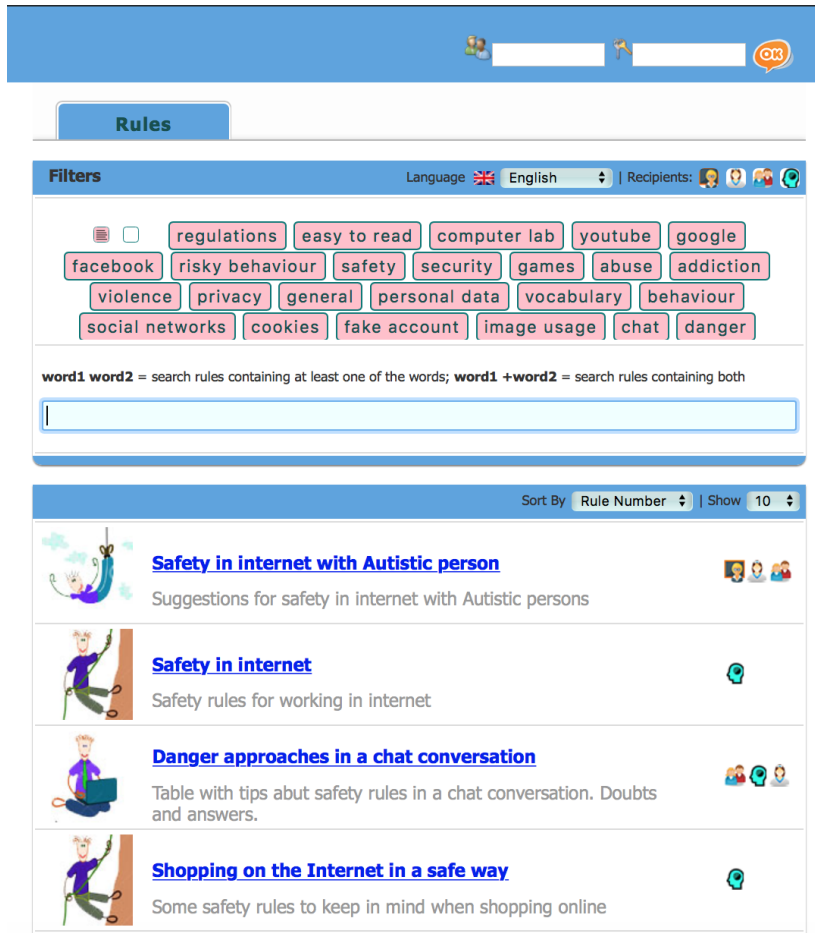


Figure 3 - Database with the rules

After gaining skills during working on the and database rules partners were ready to prepare the certification process. This task consisted of several steps:

- preparing and creating the handbook;
- certification process and granting the certificate rules working out;
- conducting certification processes.

The “Safe Laboratory for Persons with Intellectual Disability - Certification Handbook”, figure 4 <http://safelabs.eu/en/resources/>, was intended to be a help for computer laboratories leaders. There are collected requirements to be met in laboratory equipment and software configuration. Also, the description how the requirement can be fulfilled is included.

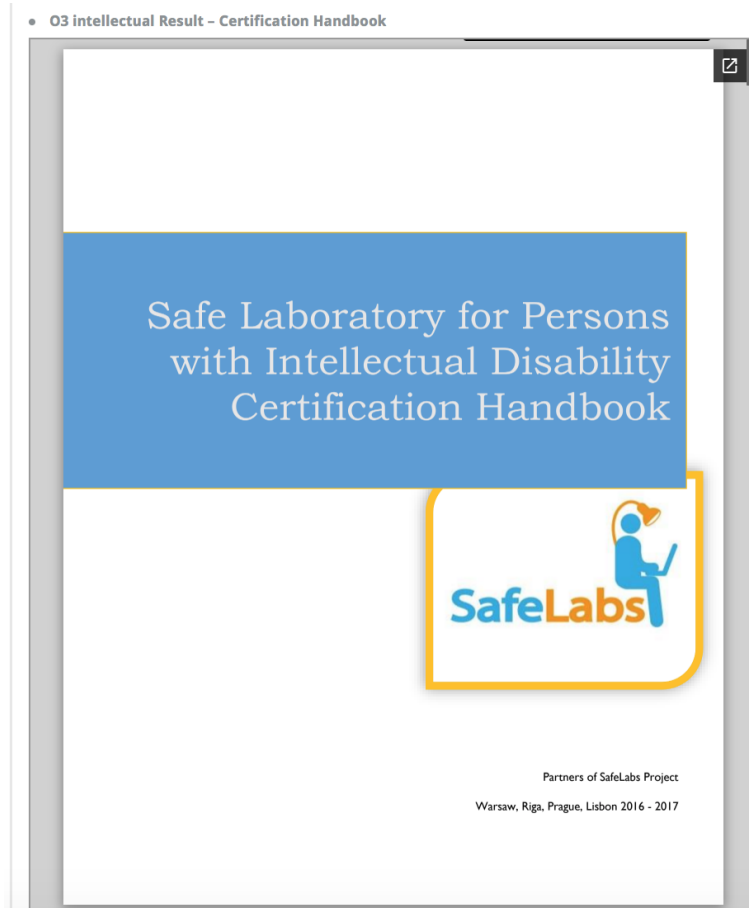


Figure 4 - Certification Handbook

The handbook is a great help in a certification process not only for computer laboratories leaders but also for Main Trainers - persons trained to conduct certification processes.

The Handbook is divided into three parts:

1. Technical Requirements;
2. Software Requirements;
3. Safe Behaving Rules

and in the end of the publication the checklist can be found.

Project partners worked out the complete procedure of granting a certificate to computer laboratory. Beside the checking of the requirements by a Main Trainer, the certification procedure involves carrying out the course for persons with intellectual disability, figure 5, led by a Main Trainer and named Supporting Trainer.



Figure 5 - Course for persons with intellectual disability

A Supporting Trainer is a person with intellectual disability who uses computer and internet at a higher level when compared with other persons with disability. She or he shares her/his experience during the course. Also, a Supporting Trainer can present the database's functionalities and rules or support a Main Trainer whenever it is necessary and agreed before the course.

During the visit to the computer laboratory the Main Trainer checks all the requirements according the checklist. The SafeLabs Certificate is granted if 75% of requirements is positively checked. The certification executor fills the certification process assessment form and sends it to the project coordinators. Basing on the form the consortium grants the SafeLabs Certificate, figure 6. The computer laboratory gets the signed Certificate and a special sticker to mark the laboratory as a place safe for persons with intellectual



disability.

Figure 6 - Certificate Lab

As it was shown above to conduct certification process involvement of Main and Supporting Trainers is needed. Project partners worked out the course for Main Trainers. The set of materials to the course, figure 7, is published on the project site, in resources module (<http://safelabs.eu/en/resources/>) as O4 (Intellectual Output no 4) result.

- **O4 intellectual Result – package of course for Main Trainers materials**
 - [agenda example](#)
 - [certification process and handbook](#)
 - [other issues – support of persons with intellectual disability as trainers, database tools](#)
 - [materials for course for persons with intellectual disability – part 1 and part 2](#)
- **Easy to Read Text Guiders.** The guiders were prepared by partners in [DisFit project](#) (2014-2015, Leonardo da Vinci).



[English Guider in pdf](#)



[film in Polish with English subtitles](#)

Figure 7 - materials to the course

Every partner conducted several certification processes. The Certificates were granted to majority of checked computer laboratories. The list of these laboratories is published on the SafeLabs project website (<http://safelabs.eu/en/certifikace/>)

CONCLUSIONS

The main effort of the project was to create safe and favourable conditions for people with intellectual disabilities to work in the computer labs. The SafeLab Certificate ensures that the place where people with mental disabilities work is a safe area. The set of requirements is available in the form of a SafeLabs certification handbook.

The Main National Trainers were trained according Guide to be able to help in improving computer labs safety and training people with disability in safe internet behaving.

The database and the certifications become popular among computer laboratories' leaders in partners' organizations. Certification is a chance to check the laboratories' configuration, software and surroundings and to create a safe place to persons with disability - a group which is still socially and digitally excluded. Partners are convinced the database and the certification should be developed and widely spread. Partners are going to try to extend the certificate to national or even European level.

REFERENCES

- Center for Technology Implementation. (2014). Teaching students with disabilities about online safety. Washington, DC: American Institutes for Research. Retrieved from: <http://powerupwhatworks.org/technology/teaching-students-disabilities-about-online-safety>
- Chadwick, D.; Wesson, C.; Fullwood, C. Internet Access by People with Intellectual Disabilities: Inequalities and Opportunities. *Future Internet* 2013, 5, 376-397.
- Friend or Fake – ETR booklet free to download. Retrieved from: <http://arcuk.org.uk/safetynet/files/2012/08/Friend-or-Fake-Booklet.pdf>
- Guidelines for Accessible Information. ICT for information accessibility in learning (ICT4IAL). Retrieved from: <http://www.ict4ial.eu/guidelines-accessible-information>
- Holmes, K. M., & O'Loughlin, N. (2014). The experiences of people with learning disabilities on social networking sites. *British Journal of Learning Disabilities*, 42(1), 1–5.
- How can people with disabilities work on Internet? Retrieved from: <https://www.jaknainternet.cz/page/1653/internet-a-handicapovani/>
- The Web We Want. Handbook for educators, lesson plans and safety activities. Retrieved from: <http://www.webwewant.eu>

Serious Game as a Way to Boost Self-Regulated Learning in Higher Education

Rosemary SAMANIEGO OCAMPO

Universidad Técnica de Machala

rsamaniego@utmachala.edu.ec

ABSTRACT

Educational technology favors learning in the university context. In the same way, in the last decades, self-regulated learning has gained relevance in the scientific community because students controls, at their own pace, the way they learns best. Therefore, the present study analyzes educational praxis linked to serious game, in order to identify the self-regulation strategies that are enhanced. Design-Based Research was utilised to examine a group of 30 students of Sociology at the Technical University of Machala (UTMACH), in Ecuador. During the analysis of the data collected with a parametric t-test it was identified that out of the 10 self-regulation strategies analyzed, serious gaming primarily boosts three of them: goal-setting and planning; seeking information; and self-consequences.

INTRODUCTION

At present, serious gaming is seen as a valuable alternative to promote learning; however, there still are unexplored aspects (e.g. self-regulation). There is no clear evidence of the contribution of this type of computational game in self-regulated learning. Therefore, the main objective of this research is to identify whether self-regulated learning is enhanced during an educational praxis using the "Seré Investigador" ("I will be an investigator") game (Samaniego, 2015).

Connection between serious games with learning in higher education

A Serious Game (SG) is a type of computer software that favors learning. It has actually been a challenge for the designers of these educational games, in the last decades, to integrate entertainment with learning (Wouters, Van Oostendorp, Boonekamp and Van der Spek, 2011). This software has been used in the educational praxis of technical and scientific universities (Bellotti, Berta, De Gloria, Lavagnino, Antonaci, Dagnino, Ott, Romero, Usart, Mayer, 2014). During the educational praxis using a SG in higher education, the most relevant aspects that have been favored are: critical thinking and scientific reasoning (Halpern, Millis, Graesser, Butler, Forsyth, Cai, 2012); student engagement (Boyle, MacArthur, Connolly, Hainey, Manea, Kärki, and Van Rosmalen, 2014); and academic performance (Carr and Bossomaier, 2011; Hainey, Connolly, Stansfield, Boyle, 2011; Boada, Rodriguez-Benitez, Garcia-Gonzalez, Olivet, Carreras, & Sbert, 2015).

The self-regulation of learning: an emerging conception in higher education

Self-regulated learning refers to the process by which students activate and maintain by themselves their motivation, cognition, and behaviors that are systematically aimed towards the attainment of their learning goals (Zimmerman & Schunk, 2011). This form of learning has been researched in the last decades as aptitude and as an event (Winne and Perry, 2000). Self-regulation has been evaluated as an aptitude using mainly the following instruments: the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich, Smith, Garcia, & McKeachie (1993); the Learning and Study Strategies Inventory (LASSI) designed by Weinstein, Schulte, & Palmer (1987); and the Self-Regulated Learning Interview Scale (SRLIS) developed by Zimmerman & Martinez-Pons (1986). Furthermore, according to Winne and Perry (2000), self-regulated learning has been measured as an event using protocols to measure thinking aloud (Think Aloud Measures) and methodologies that trace the path of student activities (Trace Methodologies).

Serious game and self-regulated learning at UTMACH

In the present study the self-regulation strategies of the "Seré Investigador" serious game was adapted. The game was redesigned to support self-regulated learning. This research considered self-regulation as the student's aptitude and was structured based on the following question: does serious game boost self-regulation?

PARADIGM AND RESEARCH METHODOLOGY

Due to the nature of the present study – research on technology-based learning – Design-Based Research (DBR) (Sandoval, 2004; Reeves, Herrington & Oliver, 2004; Hickey, Kruger, Frederick, Schafer & Zuiker, 2003) was used as the methodological approach. According to The Design-Based Research Collective (2003) guidelines, DBR is used because the data collected, analyzed and discussed allows designing and improving serious games.

Under this paradigm, one of the most used models of design-based research is presented by McKenney and Reeves (2012), which identifies three main phases that are implemented in an interactive and flexible way: analysis/exploration, design/construction, and evaluation/reflection. A representation of this generic model, which was used in the present study, is presented in Figure 1.

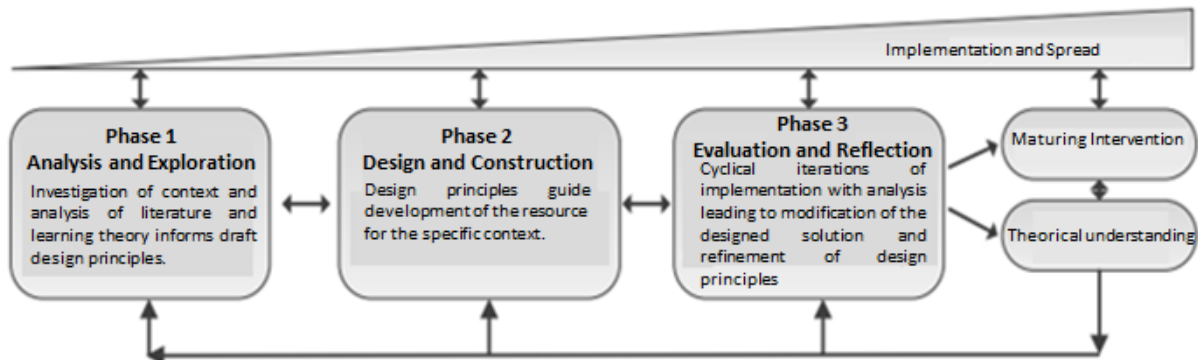


Figure 1. Design-Based Research Model by McKenney & Reeves (2012, page 77)

Research methodology

Phase 1: Analysis and exploration.

Contributions from different learning theories on the field of self-regulation were reviewed. At this point it was of vital importance to examine the theoretical findings of Bary Zimmerman. In the review of these theories, Zimmerman (2001) identifies 7 perspectives: operant, phenomenological, socio-cognitive, volitional, Vygostkian, constructivist and information processing. From the analysis of these perspectives the socio-cognitive vision of self-regulation was chosen for our educational research.

In addition, the review of scientific literature established the cyclical model of socio-cognitive researchers Zimmerman and Moylan (2009) as a self-regulated learning model for educational intervention with serious games. This model consists of three phases: planning, execution and self-reflection. According to what was reviewed both in the theoretical and social cognitive perspective and in the self-regulated learning model, self-regulated learning strategies was identified, which were used to assess the self-regulation of students once they used a serious game.

Then, an analysis of the serious game components carried was out to see if the strategies mentioned in the previous paragraph easily adapted to both the design and the mechanics of the game.

Phase 2: Design and construction.

The serious game was designed with scenarios from each didactic unit and presented the player with a sequence of educational challenges very similar to the cycle of socio-cognitive self-regulation (planning, execution and self-reflection) of Zimmerman and Moylan (2009). The way the player moves through the different scenarios while self-regulating is displayed in Figure 2.

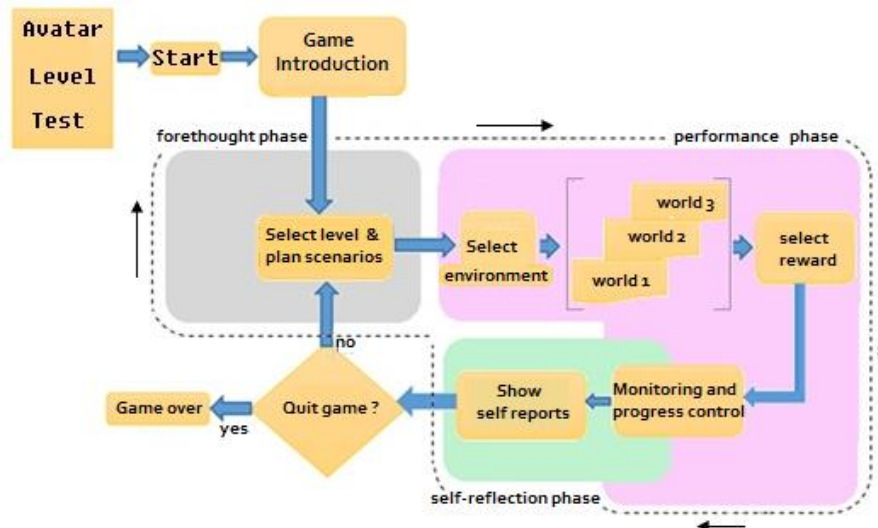


Figure 2. Sequence design of the game "Seré Investigador" and self-regulated learning

In the *forethought phase*, according to the legends each scenario had educational content and time to complete it, the player selected the scenarios according to the time he wanted to play and the learning outcomes he wanted to achieve.

In the *performance phase*, if the players want, they can first set up ambience and musical sounds, then during the game they can also configure the rewards they will receive if they succeed in the challenge presented by the game. In addition, while playing, the students may, if they wish at any time: choose clues and monitor the progress of what is played and learned. The clues play an important role in the visual environment of the game, as illustrated in Figure 3, since they are also self-regulation strategies adapted within the game (for example, information search is packaged in images of books).

In the *self-reflection* phase, as in the previous phase, one can monitor what has been played and learned; it is possible to analyze, if desired, self-reports prepared by means of the Trace Methodologies (automatic records of user actions within the serious game), and based on it, rethink new scenarios within the game, including new strategies.



Figure 3. Visual environment of the "Seré Investigador" serious game.

Phase 3: Evaluation and reflection

The serious game evaluation was carried out during the first semester of 2016; specifically the initial iteration was performed during the first mid-semester, and the last iteration in the second mid-semester. In total, two iterations were carried to educationally test the game, one iteration for each mid-semester.

In each iteration, the students used the serious game during the educational praxis of the Métodos Cuantitativos de Investigación course. At the end of the first semester, the studied students were interviewed using the Entrevista de Autorregulación Basada en Juego Serio (EABJS), this measurement was used as a pre-test; likewise, at the end of the second mid-semester the post-test was applied, with the same instrument to see the empowerment of self-regulation strategies promoted by the serious game.

Participants

In the evaluation process, 30 students enrolled in the course on Métodos Cuantitativos de Investigación participated in order to see if serious gaming promoted self-regulated learning strategies. The students belonged to the second semester of the UTMACH Sociology program.

Instruments to collect information

The data collection instrument for the present study (EABJS) was designed from the Self-Regulated Learning Interview Schedule (SRLIS), developed by socio-cognitive researchers Zimmerman and Martinez-Pons (1986). For the final instrument, 10 categories of self-regulation strategies were kept: Self-evaluation, organizing and transforming, goal-setting and planning, seeking information, keeping records and monitoring, environmental structuring, self-consequences, rehearsing and memorizing, seeking social assistance, reviewing records.

RESULTS

To ensure the reliability of the EABJS instrument, the Cronbach statistical test was applied. The instrument obtained a Cronbach's alpha of 0.961 (see Table 1).

Table 1. Cronbach's Coefficient Alpha of self-regulation strategies (EABJS)

Cronbach's alpha	Number of items
.961	10

Based on descriptive statistics (mean and standard deviation), differences were observed in pre-test and post-test measures on the use of self-regulation strategies.

Table 2. Mean and standard deviation pre and post test

	Pre-test	Post-test
self-regulation strategies	M(SD)	M(SD)
Self-evaluation	.68 (.589)	.76 (.554)
Organizing and transforming	.65 (.646)	.71 (.579)
Goal-setting and planning	.76 (.654)	.88 (.591)
Seeking information	.76 (.699)	.88 (.640)
Keeping records and monitoring	.76 (.781)	.79 (.687)
Environmental structuring	.50 (.615)	.59 (.609)
Self-consequences	.94 (.736)	1.03 (.674)
Rehearsing and memorizing	.50 (.564)	.59 (.557)
Seeking social assistance	.47 (.615)	.56 (.613)
Reviewing records	.38 (.551)	.47 (.563)

According to the differences found in Table 2, the t-test for related samples was used for an intra-group analysis (Table 3) between the pre and post test means. All analyzes were performed using the SPSS v.22. Statistical software.

Table 3. Intra-group t-test of EABJS

self-regulation strategies	t	p
Self-evaluation	-1,989	,056
Organizing and transforming	-1,409	,169
Goal-setting and planning	-2,249	,032
Seeking information	-2,757	,010
Keeping records and monitoring	-1,795	,083
Environmental structuring	-1,439	,161
Self-consequences	-2,504	,018
Rehearsing and memorizing	-1,682	,103
Seeking social assistance	-1,882	,070
Reviewing records	-1,649	,110

The t-test for related samples was used to analyze statistically significant differences between the means of use of self-regulation strategies during the pre and post test. The above table does not show statistically significant differences in any of the strategies analyzed during the pre-test. However, in the post-test significant differences were observed in three variables: goal-setting and planning ($t=-2.249$, $p=.032$), seeking information ($t=-2.757$, $p=.010$), self-consequences ($t = -2.504$, $p=.018$).

CONCLUSIONS

This study is a self-regulated learning approach using a serious game. Although serious games usually have some self-regulation strategies within their components, it is advisable to adapt them to fit a certain self-regulated learning model.

The cyclical self-regulated learning model of socio-cognitive researchers Zimmerman and Moylan (2009) favors the sequence of the game as the student learns.

The frequency of use of some self-regulation strategies increases when using a serious game in educational praxis.

REFERENCES

- Bellotti, F., Berta, R., De Gloria, A., Lavagnino, E., Antonaci, A., Dagnino, F., Ott, M., Romero, M., Usart, M., Mayer, I. S. (2014). Serious games and the development of an entrepreneurial mindset in higher education engineering students. *Entertainment Computing*, vol. 5:4, 357–366. DOI: <http://dx.doi.org/10.1016/j.entcom>.
- Boada, I., Rodriguez-Benitez, A., Garcia-Gonzalez, J. M., Olivet, J., Carreras, V., & Sbert, M. (2015). Using a serious game to complement CPR instruction in a nurse facility. *Computer Methods and Programs in Biomedicine*, 122(2), 282–291. DOI: 10.1016/j.cmpb.2015.08.006.
- Boyle, E. A., MacArthur, E., Connolly, T., Hainey, T., Manea, M., Kärki, A., & Van Rosmalen, P. (2014). A narrative literature review of games, animations and simulations to teach research methods and statistics. *Computers & Education*, 74, 1–14. DOI: 10.1016/j.compedu.2014.01.004.
- Carr, D. & Bossomaier, T. (2011). Relativity in a rock field: A study of physics learning with a computer game. *Australasian Journal of Educational Technology*, 27(6), 1042–1067. DOI: <http://dx.doi.org/10.14742/ajet.928>.
- Hainey, T., Connolly, T., Stansfield, M., & Boyle, E. (2011). Evaluation of a game to teach requirements collection and analysis in software engineering at tertiary education level. *Computers & Education*, 56, 21–35. DOI: 10.1016/j.compedu.2010.09.008.
- Halpern, D.F., Millis, K., Graesser, A.C., Butler, H., Forsyth, C., & Cai, Z. (2012). Operation ARA: A computerized learning game that teaches critical thinking and scientific reasoning. *Thinking Skills and Creativity*, 7, 93–100.
- McKenney, S., & Reeves, T. C. (2012). *Conducting educational design research*. Oxon: Routledge.

- Pintrich, P. R., Smith, D. A. F., Garcia, T., & Mckeachie, W. J. (1993). Reliability and predictive validity of the motivated strategies for learning questionnaire (MSLQ). *Educational and Psychological Measurement*, 53(3), 801–813. DOI:10.1177/0013164493053003024.
- Samaniego, R. (2015). Diseño, desarrollo y validación de un juego educativo para Métodos Cuantitativos de Investigación. (Trabajo fin de máster no publicado). Universitat de les Illes Balears, Departamento de Pedagogía Aplicada y Psicología de la Educación, España.
- Weinstein, C. E., Schulte, A. C., & Palmer, D. R. (1987). *Learning and study strategies inventory*. Clearwater, FL: H & H Publishing.
- Winne, P. H., & Perry, N. E. (2000). Measuring self-regulated learning. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 531–566). Orlando, FL: Academic Press.
- Wouters, P., Van Oostendorp, H., Boonekamp, R., & Van der Spek, E. (2011). The role of Game Discourse Analysis and curiosity in creating engaging and effective serious games by implementing a back story and foreshadowing. *Interacting with Computers*, 23(4), 329-336. DOI: 10.1016/j.intcom.2011.05.001.
- Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning-strategies. *American Educational Research Journal*, 23(4), 614–628.
- Zimmerman, B. J., & Moylan, A. R. (2009). Self-regulation: Where metacognition and motivation intersect. In D. J. Hacker, J. Dunlosky & A. C. Graesser (Eds.), *Handbook of Metacognition in Education* (pp. 299- 315). New York: Routledge.
- Zimmerman, B.J. (2001). Theories of Self-Regulated Learning and Academic Achievement: An Overview and Analysis. En B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: theoretical perspectives* (pp. 1-39). Mahwah, N.J.: Lawrence Erlbaum Associates Publishers.
- Zimmerman, B. J., & Schunk, D. (2011). *Handbook of self-regulation of learning and performance*. New York, NY: Routledge.

Share and Teach: A New Interactive Way of Designing Teaching Materials on Different Devices

Laura GIRALDI

Department DIDA – DESIGNCAMPUS

University of Florence - Italy

laura.giraldi@unifi.it

Romina NESTI

Department SCIFOPSI

University of Florence - Italy

Romina.nesti@unifi.it

Lara MUSA

Department DIDA - DESIGNCAMPUS

University of Florence - Italy

lara.musa03@gmail.com

ABSTRACT

Still today, interactive tools and touch screen devices are used in a traditional way by many teachers to prepare educational materials without using the most of the possibilities offered by new technologies.

The objective of this research is to promote a new way of using interactive white boards (IWB). The project, named “Share and Teach”, is dedicated to teachers and students of the primary school and proposes a new collaborative approach in managing and integrating training materials using interactive systems. In order to improve awareness among the users, this research has developed an innovative human machine interface (HMI) with a friendly graphic user interface (GUI) used to design educational items that can be accessed and modified through many kind of devices (IWB, pc, tablet, smart phone).

This tool lets users to save data also on cloud with the possibility to log in and to work on the platform from everywhere. Finally, this method allows teachers to share and compare the strengths and weaknesses of the different teaching methodologies.

Keywords: interactive white boards,, design, friendly graphic user interface, teaching, learning.

INTRODUCTION. CONTEXT OF REFERENCE

In recent years, the development and dissemination of information and communication technology has undergone considerable transformations, becoming an integral part of our lives. the daily life of us all.

Digital technologies have therefore become an infrastructure that enable much of human activity, from training to working , from fun to socialization, from online payment to the delivery of different types of services.

As a consequence and effect of this change, digital skills (Innovation Communication Technology) have also gained a significant place in the European education system since the Seventies. A huge amount of money has been invested to provide the school – from the primary school to the university - with technological equipment, in a climate of trust and general enthusiasm.

The history of educational technologies to improve students skills and learning is long and full of difficulties.

The continuous need of rethinking the level of learning settings to improve the students’ performances promoted the development of innovative systems of learning and teaching.

The resulting school has to be inclusive and able to create a new way of designing lessons to increase students’ participation and abilities. Today the use of ITC at school is supported by international politics and a considerable quantity of economic investments. For instance, in 2006, the European Commission fixed eight educational key competences * for the education of the citizens of the future. These are, as follow:

1. Communication in one's mother tongue.
2. Communication in foreign languages.
3. Basic skills in maths and science.
4. Digital skills.
5. Learning to learn.
6. Social and civic responsibility.
7. Initiative and entrepreneurship.
8. Cultural and awareness.

* http://ec.europa.eu/education/policy/school/competences_en

Other drivers to the school change are due to the migration phenomena – multiethnic classrooms - and the need of inclusive teaching according to different cultures.

The traditional school is inadequate to the profound change of culture in the era of technology.. The contemporary society needs of people with new competences and the abilities of learning throughout their life. It's necessary to realize a changing to create a new dynamic school able to answer to the new society needs. Today the strategies on teaching research are not only based on contents, but also on learning methodologies. According to this direction a new focus is represented by the concept of lifelong learning.

The main items of teaching are:

1. the contents - know what - belonging to the cognitive area and including information and meanings.
2. The values - know why – belonging to the emotional and functional areas and responsible of the development of the personality.
3. The competences – know how – related to the conscious and creative application of the know how held in specific contexts.

The innovation for learning also requires new competences for teachers. They do not need only basic pedagogical teaching knowledge, but much more. The profile of the new teachers has to include the know-how in technological field in order to allow them to use and manage the potentiality of ICT.

According to the previous concept it is appropriate to quote the European Commission work that defined a common European framework, defining how teachers have to interact:

1. Themselves : teachers modifies their practice to changing contexts.
2. Students: teachers have to adjust their teaching methodologies according to a new school's vision.
3. Colleagues: teachers involve other teachers and share their methodologies with a professional community.
4. External context: teachers relate with students' parents and with the students' work areas.

These new kind of teachers are called "pioneer" teachers. For the development of such a professional figure, the new technologies are fundamental. The educator has to live in a virtual community while developing processes of innovative teaching, Inside the community teachers could compare, experiment and share their ideas and strategies with colleagues all over the world.

INTERACTIVE WHITE BOARDS AND THEIR ROLE IN LEARNING INNOVATION

In the contemporary scenario, the research for teaching technologies focuses on the users' needs in relation to new methodologies and strategic ways for learning.

The Interactive White Board (IWB) represents the main solution adopted at school to answer these needs, The IWB proposes a new inclusive learning model able to involve a large number of students to participate and to collaborate in active and interactive way to the classroom tasks. The results are better in comparison with the traditional methods.

The first IWB was designed about in 1990 for using in offices during meetings and presentations. Then the IWB starts to be used at school, as a new tool for teaching and learning. From 2007 the use of IWB has increased in both primary schools and secondary schools during lessons.

The Interactive White Board is a large interactive display, a standalone touch screen, to be used independently to perform the desired tasks and that could be controlled by the computer. Users can manipulate the virtual elements using fingers directly on the screen. The IWB allows users to integrate media contents into lectures supporting collaborative learning and offering a wide range of teaching opportunities. Consequently teachers, using IWB, are able to redesign and personalize their learning settings.

Summarizing the IWB peculiarities for learning are:

1. Stimulating attention and motivation improving learning in classroom.
2. Allowing the learning of concepts and content through innovative communicative means.
3. Letting the independent creation of learning content in a new way (i.e. realizing digital storytelling).
4. Developing metacognition processes changing the criteria of evaluation and self-evaluation.
5. Promoting the use of cooperative learning methodologies and the development of problem-solving skills.
6. Evolving autonomous learning processes (i.e. according to flipped class models).
7. Improving participation and engagement through meaningful learning forms, user-centred.
8. Students become actors of their own training path.

The use of the IWB redefines the learning setting and the model of instructional design. The didactic strategies change from a transmissive mode based on student's idea as a passive knowledge receiver to an interactive and collaborative mode, where know-how and knowledge are built according to direct experiences and interactions of students, teachers, learning materials living in that specific scenario.

What basically differentiates the IWB from the traditional blackboard or the common use of video projector is the possibility to give the access to knowledge through three different channels simultaneously.

Using indeed the IWB students could live multi-sensorial experiences, learning through three different senses at the same time: (Beeland, 2002) visual, auditive and tactile

Unfortunately despite of these potentialities, still today, the software generally diffused and used on IWB did not offer the possibility to exploit at the best the potentialities of this innovative interactive tool. Furthermore the graphic user interface is not easily accessible and usable and the digital tool results not friendly and not usually able to facilitate the use.

LEARNING SETTINGS STRATEGIES

The support of Interactive White Board in classroom could stimulate the attention and the motivation of students improving the learning of the whole class. Moreover it could allow the learning of concepts and content through various communicative media such as videos, images, documents, maps etc., also modifying and improving the traditional "frontal" lesson. The IWB could allow independent creation of learning content in innovative ways that could be shared by all the class (for example, through the realization of digital storytelling). Through the use of IWB it is also possible to implement metacognition processes (an individual's awareness of one's own ability and cognitive processes), this could change the criteria for evaluation and self-evaluation of the students. If used at the best of its potentiality the IWB is able to develop cooperative learning methodologies, developing problem solving skills. The IWB has also the ability to develop independent learning processes - according to flipped class models - increasing the skill of participating and engaging, creating learning methodologies focused on students.

Possible ways of use

- Introducing "Key Concept".
- Searching information.
- Presenting the content of lessons.
- Presenting different kind of video formats.
- Evaluating learning activities.
- Sharing the students' work.
- Saving lessons.

Main functions:

- Running the software that is loaded into the connected PC.
- Capturing and saving notes written on IWB to the connected PC.
- Controlling PC from IWB.
- Using software able to translate italic writing into digital text.
- Using computer software for digital drawing and other basic function of digital languages.

Possible operations for teachers:

1. Realizing “conceptual maps”.
2. Making a brainstorming.
3. Organizing and managing cooperative learning activities.
4. Explaining frontal lessons.
5. Implementing metacognition processes (awareness of individuals own ability and cognitive processes).
6. Applying flipped classroom activities. Lessons that are moved at home as homework using full advantages of the online potential teaching materials. (Children have to research on topics defined in classroom).
7. Designing and realizing “authentic tasks”. Students have to build their knowledge in a active way, in real and complex context and then they have to use their know how demonstrating the acquired competence.

The aim of the use of IWB at primary school is to introduce a new contemporary tool in didactics able to develop the abilities of each child/student that are different according to their own growing.

More than three hundred teachers interviewed by Gfk Eurisko for Pearson Italia had very clear ideas: the didactics with the IWB are no longer the same, the relation with the children has improved and, it is always an advantage to have IWB in class. Though preparing lessons is more challenging (64% of them support it), 97% say they will not come back to the traditional method.

The use of IWB is effective, the students participate actively. In fact, 70% declare that they have seen an increase in the effectiveness of their teaching and, above all, it shows the satisfaction of seeing "enthusiasm, curiosity, willingness to participate and collaborate "on the face of the children.

THE AIM OF THE RESEARCH

The aim of this research is to promote a new way of using interactive white boards (IWB).

The research proposes a new interactive digital system tool able to design, integrate, manage and share educational items for teachers and students of the primary school starting from the interactive white boards (IWB). In order to spread a new practice on designing and managing educational items for teachers the aim of this research is to propose an innovative human machine interface (HMI) with a friendly graphic user interface (GUI) to be easily applied in different learning settings and in teaching methodologies. The HMI have to be accessed and modified through different kinds of devices (IWB, pc, tablet, smart phone) from everywhere.

The proposed GUI is dedicated to two different kind of users, teachers and students and it allows to interact with them according to different levels of interaction. The first level is dedicated to the teachers and allows them to design, manage, integrate and share educational items, also communicating with other teachers and specialists using the network. The second level of interface is dedicated to students of primary school and it allows them to interact and to share their lessons contents and their learning outcomes. with their class/ other classes.

The research goal is also to find a new easy method letting teachers to share and compare the strengths and weaknesses of the different teaching methodologies all over the world. From this point of view the proposed human machine interface should be able to generate interaction among teachers and students around the world in a multicultural context, favouring internationalization.

The final goal of this research is to promote a new way of using interactive white boards (IWB) making them used according to their full potential.

METHODS OF RESEARCH

The research uses the interdisciplinary approach involving two main different disciplines: educational science and design. Then the referring theoretical frameworks of this research are:

1. Universal design for learning (UDL) .
2. Human Centred Design (HCD) .

The application of the Universal design for learning, about didactic and education models generates:

“A framework of reference for the planning of pathways that guarantee the maximum flexibility of the didactics aims, methods, and valuation, in order to optimize learning opportunities for all individuals”

(Rose, Gravel, 2016, p.27)

The UDL refers to a flexible method for teachers designing learning items and didactic paths. At the centre of this model there is the development of inclusive didactic methodologies.

The principals of UDL are:

1. The necessity of proposing a variety of methods of information, representation (and knowledge) planned to be learned.
2. The possibility of engaging in learning methods according to various expressive approaches.
3. The development and the use of didactic strategies centred on engagement and intrinsic motivation.

The second discipline involved in this research is the Design and the Human Centred Design approach (HCD). The HCD process defined in the ISO 13407 in 1999 and systematized in 2010 with ISO 9241 - 210, represents a starting point of this research. It refers to the specificity of the interactive system, even though it is a resource to which the design can always refer when interactive system meant complexity of interactions determined by different entities.

The HCD, is related to getting information about the approach in question and to outlining useful design processes. In the Human Centred Design research, design, development, testing, and evaluation are the central activities of the field of human factors —with the aim of designing products for human use.

The Human Centred Design processes for interactive systems, ISO 13407 (1999), states: "Human-centred design is an approach to interactive system development that focuses specifically on making systems usable. It is a multi-disciplinary activity."

In particular the standard specifies that it is necessary to develop four activities to follow during the design of any interactive system. These activities are:

1. to understand and specify the context of use;
2. to specify user requests;
3. to produce design solutions;
4. to evaluate the project

The previous standard ISO 9241:210, 2010 at 4.1 identify six principles of human-centred design:

1. the project is based on explicit understanding of users, activities and environments;
2. the users are involved in all phases of design and development;
3. the design is guided and refined by the User-Centred evaluation;
4. the process is iterative;
5. the design considers the entire user experience;
6. the design team includes multidisciplinary skills and viewpoints.

Moreover the "User Centred Design (UCD) is a user interface design process that focuses on usability goals, user characteristics, environment, tasks, and workflow in the design of an interactive tool or products. The UCD follows a series of well-defined methods and techniques for analysis, design, and evaluation of software and web interfaces. The UCD process is an iterative process, where design and evaluation steps are built in from the first stage of projects, through implementation (*Shawn Lawton Henry, 2007*)

The User centred Design process is a concept methodology. The design is based on the explicit understanding of users, tasks, and environments; it is driven and refined by user-centred evaluation; and includes the whole user experience (UX). On the other hand the definition of the HCD has to be consider very wide. It's important to note that the UCD process does not specify exact methods for each phase.

This approach, must be understood in a broader sense as the authors Norman and Verganti said (2014, pp. 11), the HCD is like a design philosophy and not only a defined set of methods so the innovative line should start approaching users and observing their activities. Norman (2014, pp. 222) talking about the "design thinking", and how this distinguishes designers among the innovators who practice it, underlined that the human-centred design is one of the most effective method that designers have at their disposal to solve problems designing products and services. Moreover he points out that designers work according to their favourite procedures and the HCD approach could be applied using different procedures. These are really variations of the same general method, iteration of the four steps: observation, generation, creation of a prototype and verification.

TEACHERS NEEDS ACCORDING TO THE HCD (Human Centred Design) APPROACH

The above interdisciplinary method of approach represents the starting point we consider to developing the present research. This approach is open and adjustable to different situations and needs.

The process of analysis related to the application of the HCD approach starts from the observation of the users, that in this case are the teachers. The research studied their activities in classroom, at school and at home, deepening their different referring contexts of use and scenarios using interactive tools on different devices.

The research individuates teachers needs also observing them using IWB in classroom and using any other interactive digital systems for learning in different scenarios. This activity underlines that, generally, teachers did not manage to exploit the potentiality of the IWB because of the graphic user interface is not friendly and at the same time they did not find functions that they need.

According to this approach the results are that teachers need the possibility to:

1. managing, also online, their digital didactic materials and documents in a single tool.
2. Giving space to ideas. The possibility to compare various didactic methodologies with other colleague.
3. Using a flexible tool for keeping notes and for designing lessons.
4. Saving time in the research of didactic items for lessons in classroom.
5. Having the opportunity to interact with other teachers.
6. Keeping a personal and shareable diary with information on students, classrooms and teaching methodologies also in order to customize the leaning activities according to special needs of classes or students.

The above emerging needs could represent the basics of the second part of the present research centred on the design of a new interactive digital system tool. The IWB with its features is an interesting tool for developing a didactic design based on the above principles.

THE USE CASE: SURVEY TO A SAMPLE OF TEACHERS OF AN ITALIAN PRIMARY SCHOOL

The experimentation was set in a suburb of Rome, the capital of Italy. It consists in two activities interviews. and direct observation. The interviews have been carried out with 15 teachers from the first to the fifth class of the primary school inside the Comprehensive School *Calderini Tuccimei* in Rome. The questions aimed to investigate about the modality of use and interaction of teachers with the IWB. In particular the questions were asked to evaluate the following main contents:

- current way of using the IWB in the Italian primary school.
- The threats, the weakness and critical elements of IWB principles.
- The strengths, the potentiality of IWB for didactic activities.

Moreover the surveys asked teachers to specify the functionality they prefer or would like to use in IWB. The answers of the above questions represented an important point reference of the research because they identified the real way of the use of the IWB tool. The answers also underline that the primary users of this tool (IWB) have full control of the tool itself and over the spread of content to their classroom. Furthermore they are perfectly able to decide when and how use the IWB in their lessons.

In a second step teachers were invited to propose learning tools dedicated to the IWB to use in classes of primary school. The observation involved 3 classes - of the fifth class – and show how teachers and students use IWB. The remark underlined the difficulty of teachers and students to interact easily with the GUI of the IWB. The activities allowed to understand and verify teachers real needs, to evaluate their suggestions and moreover to individuate recognizable, useful and recurrent practices. The interesting data emerging from this survey resulted relevant to design the interactive digital system.

It is easy to understood that, also today, there are several difficulties to approaching the IWB at school. This tool, even after many years from its implementation at school, is not used at 100% of its potential. However, at the same time, it is strong the will to experimenting the understanding, and the full use of this new tool that could be an innovation for the teacher and students.

The results underline the elements for learning that are critical for teachers and students not allowing them to live pleasant experiences.

At the same time, the analysis helps to define a method to designing a new interactive tools able to be used in an easy and pleasant way on different devices.

SURVEY

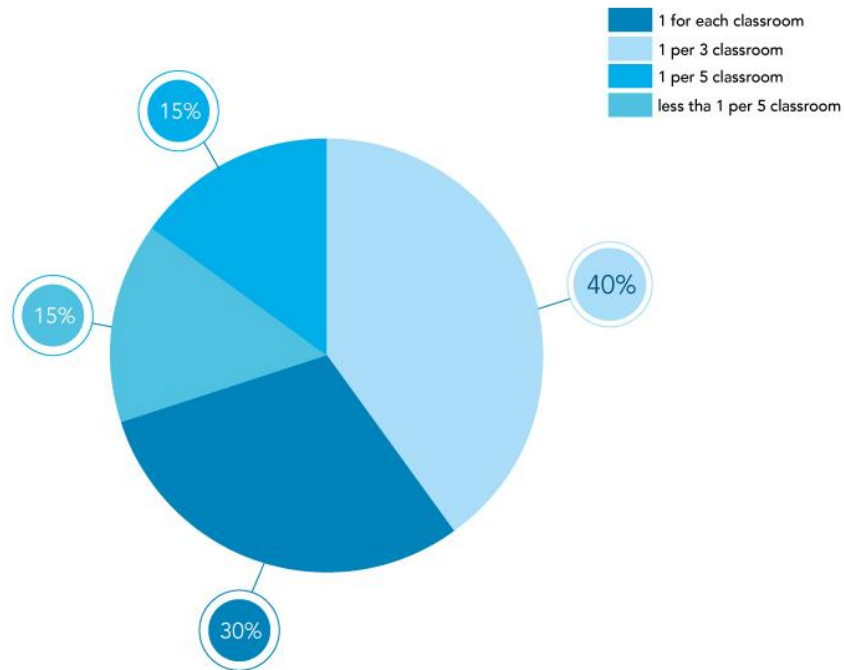


Fig. 1 Amount of IWB in Italian Classroom. Results show the lack of clarity on the availability of IWB within the Institute.

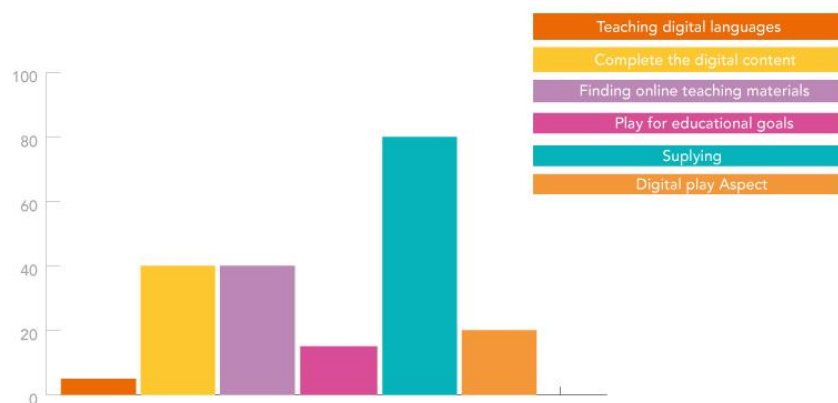


Fig. 2 “How do teachers use the IWB in classroom?” The use of the IWB as a tool for supplying teaching materials is preponderant while the play and the use for playing and for learning languages is not relevant.

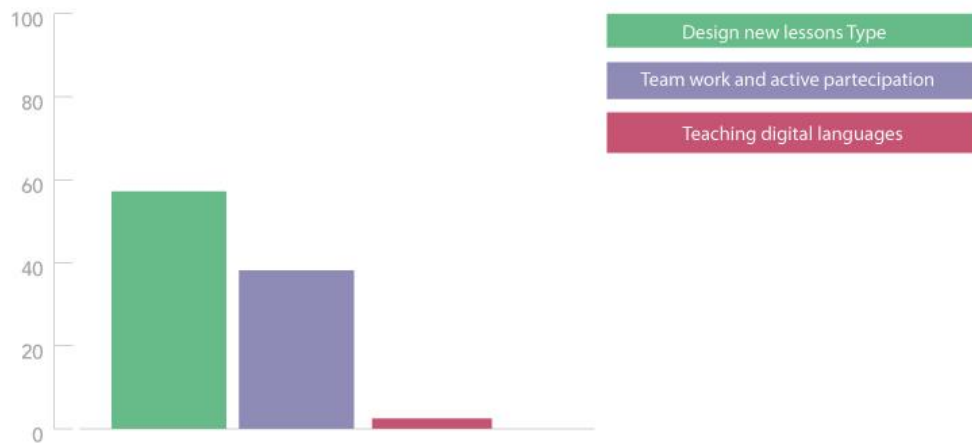


Fig. 3 How do teachers prefer to use the IWB? The lack of attention for languages learning is confirmed by the survey results. when asked to express their intentions towards using the IWB. In fact, 0% of respondents indicated the IWB use to implementing languages skills.

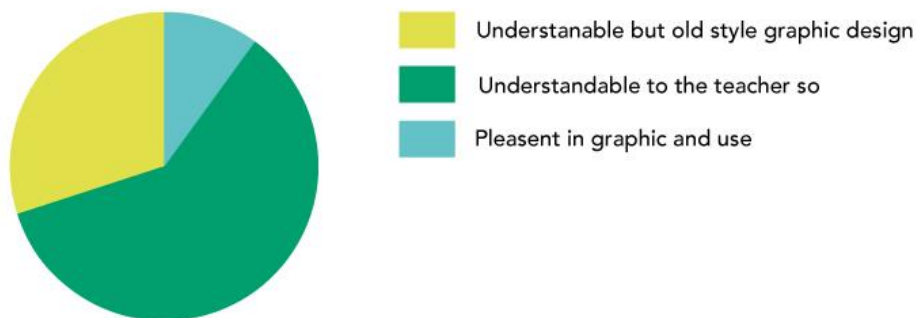


Fig. 4 What teachers think about the GUI of the IWB?.A 60% of the respondents state that IWB is understandable and therefore functional. However, this figure shows how the graphic factor and the use experience not taken into account.

THE PROPOSED HMI TOOL: SHARE AND TEACH

Share and teach: is the name of the innovative human machine interface (HMI) with a friendly graphic user interface (GUI) for designing educational items able to be accessed and modified through many kind of devices (IWB, pc, tablet, smart phone) using the network.

Share and Teach is a new tool for managing digital didactical material at primary school.

The starting points of the design of the new tool are the study results on teachers needs, summarized as follow:

1. managing work documents and the digital didactic materials in one single and online sharable content tool during all the school year.
2. Having a personal not official tool for saving notes and didactic materials useful for teachers during all the scholastic year.
3. Saving time in looking for classroom teaching material or lesson, having the opportunity to interact with other teachers.

4. Comparing and sharing learning tools and didactic items and teaching methodologies with other teachers in the network.
5. Having the possibility to compare and evaluate different didactic methods with various colleagues.
6. Keeping a shareable diary to notes any interesting information on class on students and on didactics for shaping teaching activities around the real needs.

7.

The main goals to reach with the development of *Share and teach* are, as follow:

1. Stimulating the use of IWB by teachers transforming all the first listed weaknesses in strengths.
2. Sharing digital educational material at territorial, regional, National and international level on the network.
3. Innovating the teaching material and the distribution system
4. Experimenting innovative ways to share and to internationalize the idea of a new kind of school.

The basic functions of *Share and teach* are:

1. Create / set up a personal profile
2. Access to a personal work folder
3. Quick access to school or teacher timetable
4. Access to a digital didactical material library
5. Quick access to a web search
6. Save materials from researches in a personal library
7. Save digital didactical material
8. Create digital material with IWB
9. Compare didactic material or methodologies with other teachers at school or all over the world

Share and teach is a tool with a GUI to be used on IWB during lessons in classroom, but it has the main purpose to facilitate the use of new technology in every moment of teacher's life. For this reason the tool is accessible from any type of device, tablet, pc and smartphone with a specially designed app version, to be upgraded in future. The Graphic User interface is designed to be friendly, simple and intuitive. It is composed of a hierarchical structure that start in the Homepage, where all content are accessible and visible by the user. (Map of content Fig. 5)

In the **Login page** (Fig.6) teachers (Users) can add their personal username and password and enter to the Homepage (Fig.7).

In the **Homepage**, the user can navigate in a simple and intuitive way. At the top of the screen the logged in person is identified.

During all the time of navigation experience the logged users has at their own disposal a menu that it is possible to personalize, setting up the user profile, and checking private mail messages.

The core of *Share and teach* is in "My Dashboard" section (Fig. 8) accessible from the Homepage. In this section, teachers can visualize the lists of their digital teaching materials uploaded and manage them. They can upload and download their lessons, change and save them. It is also possible to open each item in a full screen to work, copy, modify and to save.

In the section "**My Dashboard**" there is a secondary menu that allows teachers to do several actions:

- check their bookmark lessons: choosing this menu item, teachers can resume the lesson at the point of interruption.
- Check their personal school agenda. Teachers can interface with the school schedule, displaying planned engagements or seeking a meeting. Moreover, they can add an event or write a didactic observation with reference to the current date.
- View and share their class projects. The goal is to create communication among teachers, and classes.

From the Homepage it is possible to link to the "**Library**" section (Fig.9)

In this section teachers can find the official digital materials in a complete library divided in subjects of learning.

From this section it can possible to go to two different secondary areas:

1. the **Personal Library**: where teachers could collect all the materials they prefer or create educational papers. The personal library can be organized in folders and subfolders, like the structure of a personal computer.

2. the **Saved Search**: where teachers could save useful links about interesting and favourite websites. The aim is to facilitate the availability of material and to save time.

From the Homepage it is possible to link to the **"Timetable"** section (Fig.10).

In this area the users can check the school time table in real time through personal login. The tool shows to the teacher his real time position in a classroom or in a meeting.

From homepage is possible to access the **"Search"** function (fig. 11) . This section allows user to researching online digital didactical material and to save the results in a favourite list in the secondary area called **Saved Search** inside the **"Library"** section and check them in a second moment.

In order to stimulate a better use of the IWB , this tool propose to the teacher to use creative activities .

The **"Create"** command (Fig.12) from the Homepage menu leads to a unified screen where the teacher can be find the commands to create educational content.

The **"Share"** section allows to send and share materials and documents to other teachers for observations and notes.

While the rescue functions are present in **"My Dashboard"**.

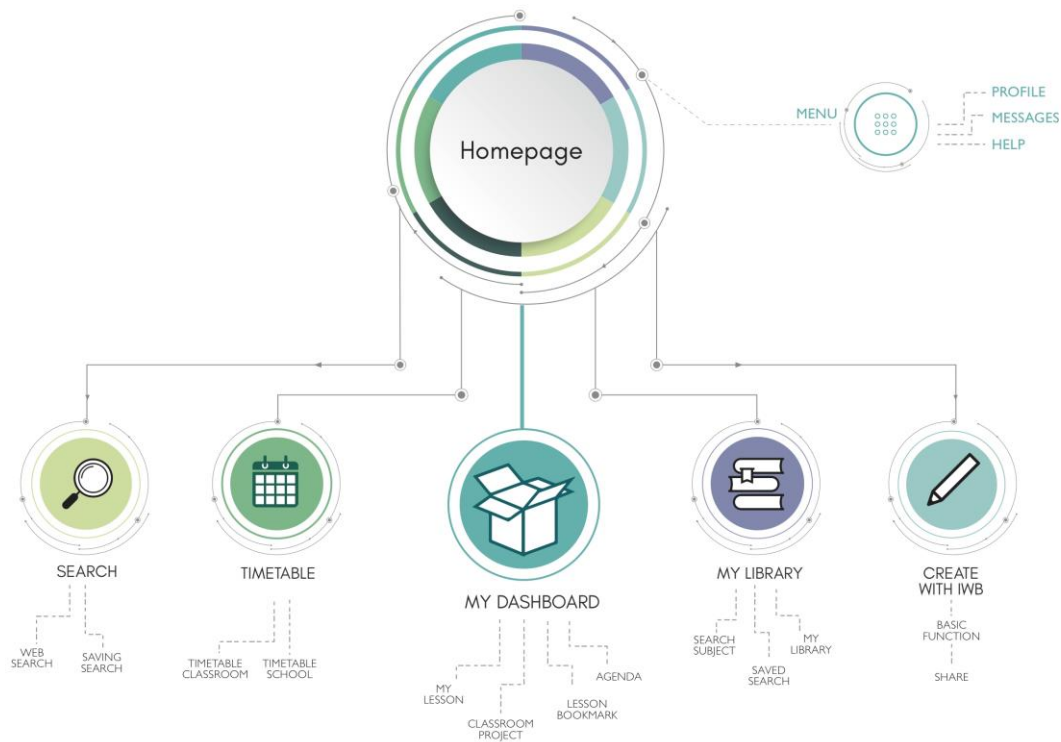


Fig. 5 *Share and Teach* map of content

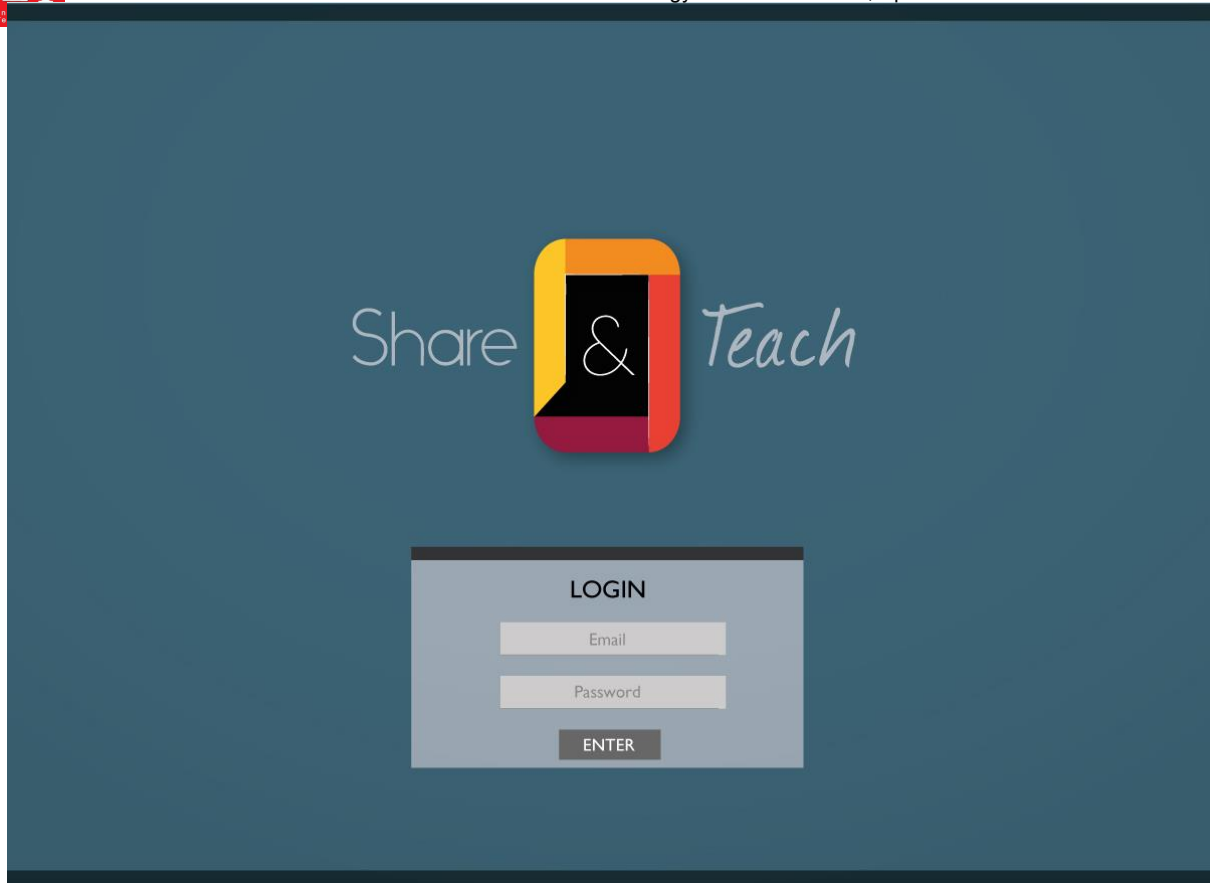


Fig. 6 Login screen

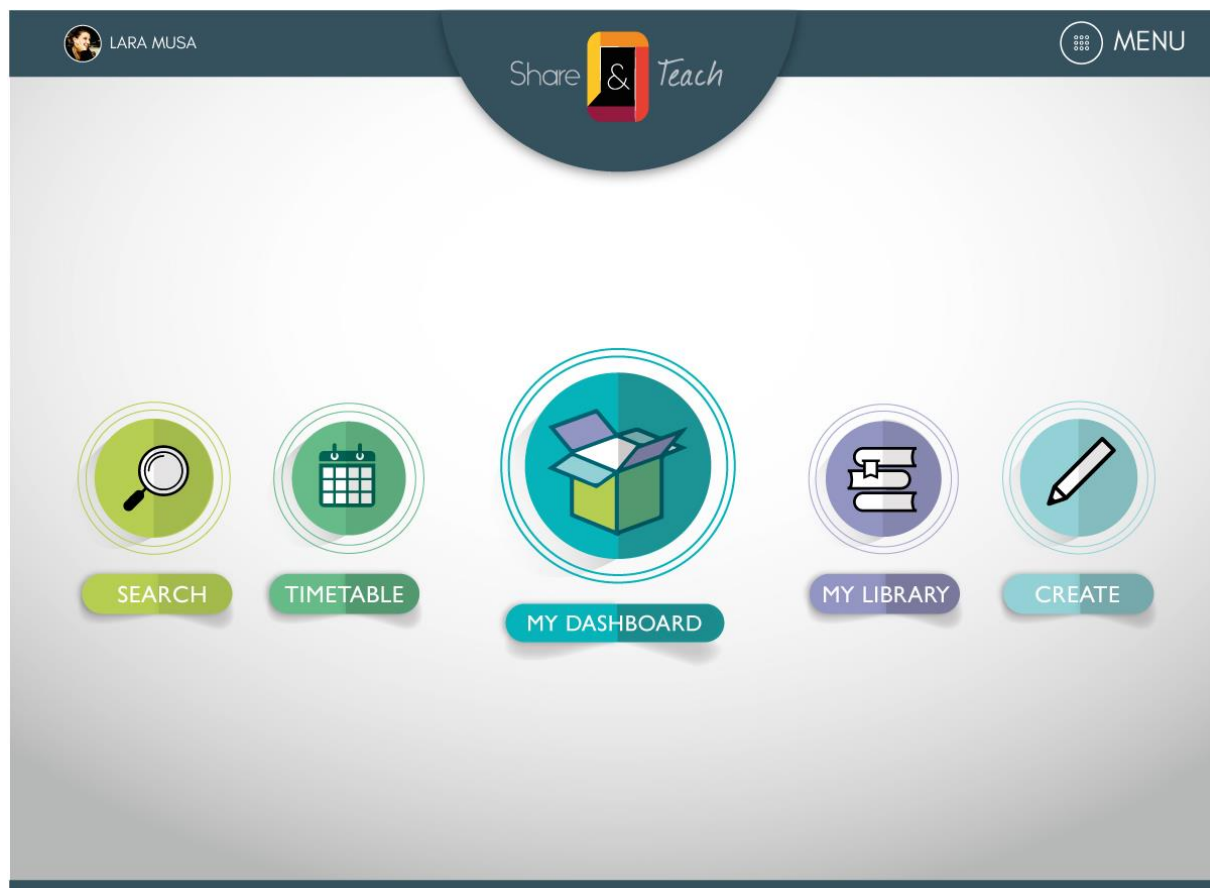


Fig. 7 Homepage screen

	TOPIC	DATE	STATO	
LANGUAGE	THE WORLD'S RIDE IN 60 DAYS	15/03/2017	✓	🔍
LANGUAGE	FRASE ANALYSIS ARTICLES	10/03/2017	✓	✍️
GEOGRAPHY	THE WORLD'S RIDE IN 60 DAYS	8/03/2017	✓	🔍
HISTORY	THE DISCOVERY OF FIRE	25/02/2017	✓	✍️
GEOGRAFIA	THE CONTINENTS	15/02/2017	✓	✍️
LANGUAGE	SUBJECT PHRASES ANALYSIS	10/02/2017	✓	🔍

Fig. 7 My Dashboard

Fig. 9 My Library

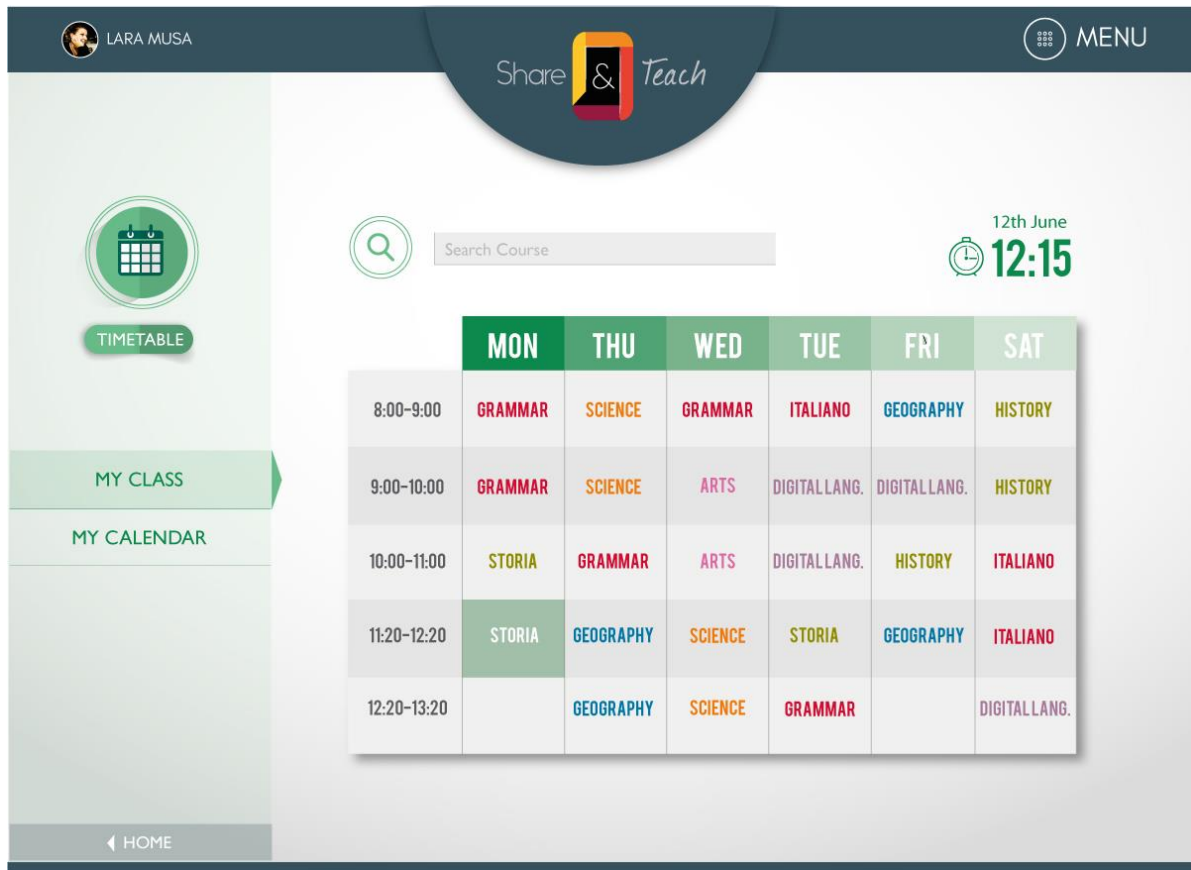


Fig.10 Timetable

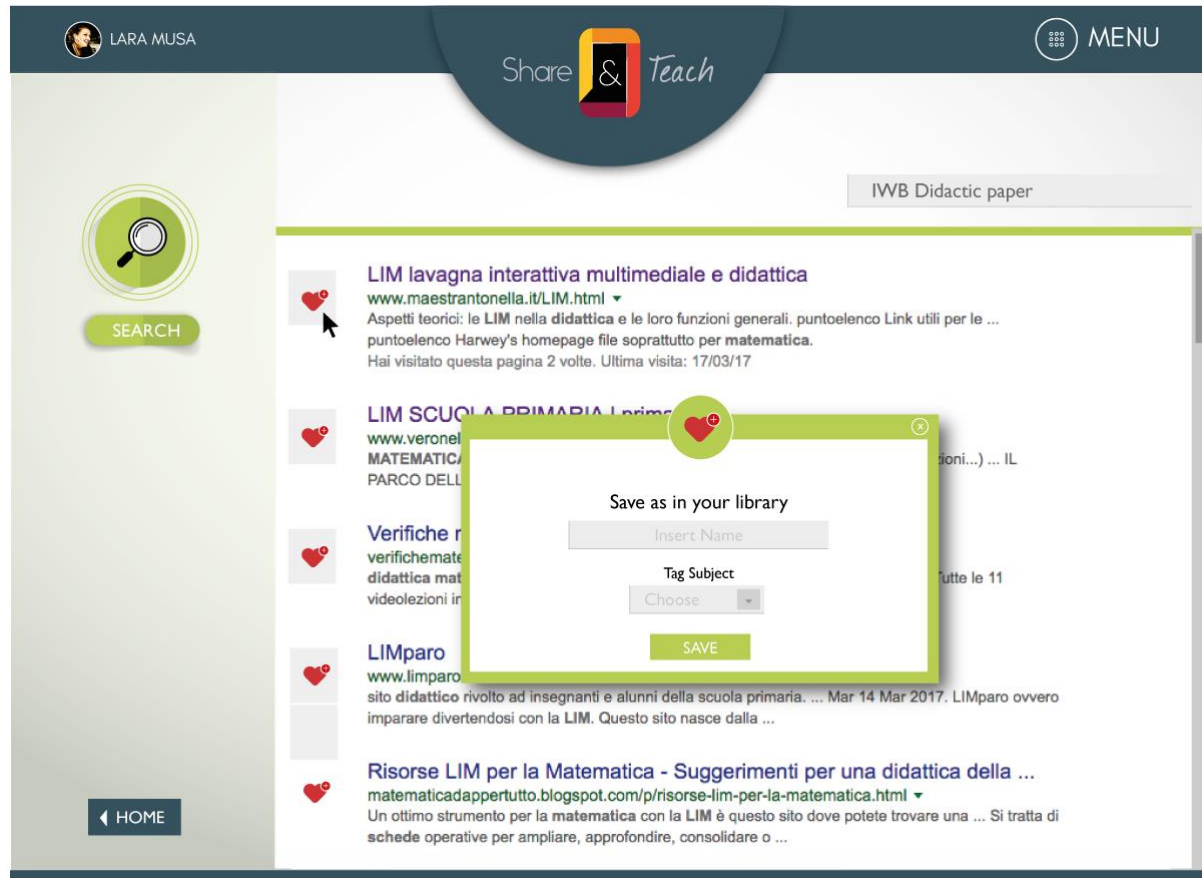


Fig.11 Search page

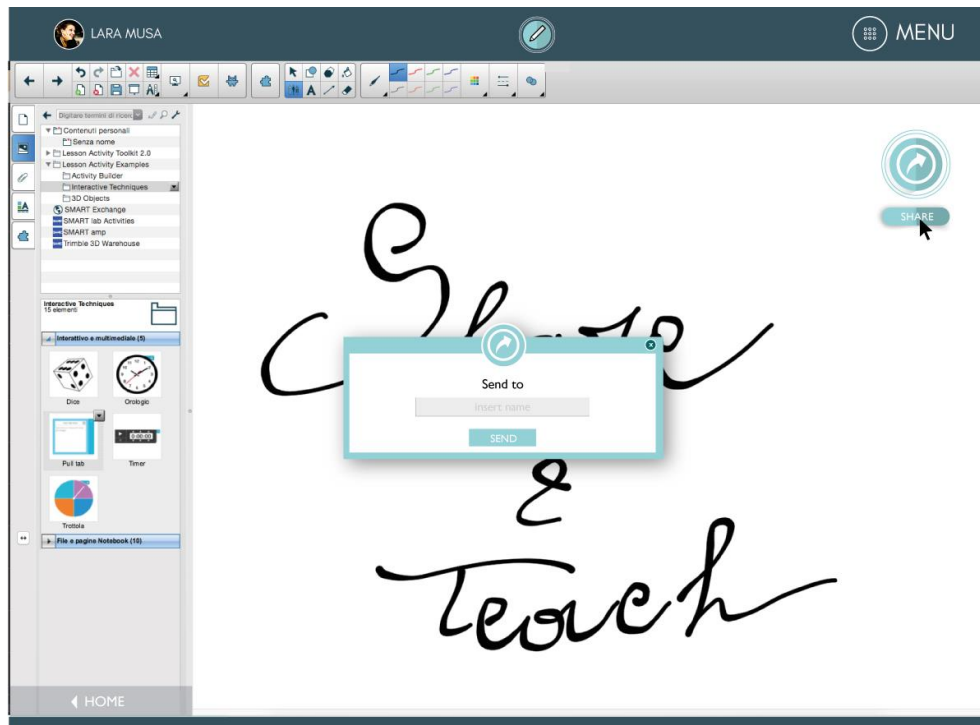


Fig. 12 Create with IWB

CONCLUSION AND PROPOSAL FOR THE FUTURE

The present work therefore aim to improve the overall quality of teaching research, to explore new challenges comparing different culture and sources of knowledge adapting the school community to the imminent changing of today society.

The tool, which works as a didactic social network, could be tested territorially, inside a small group of beta testers, in order to improve and evaluate the UX and the functionality of the tool itself.

This project, if developed inside an institutional framework, as the European Community, could provide an instrument to compare different didactic methodologies, to highlight their peculiarities, leading to an instantaneous development process, based on upgrades and improvements straight from beta-testing.

Outside the institutional context, the will to compare and sharing teaching methods is remarkable, although these are small scale projects, as internet forum or personal websites/blogs, in which teachers share their experiences, or in a smaller percentage, platforms involving also students from different countries.

In spite of its dimension, this phenomenon well demonstrates how a will to confront, share and improve is spreading inside school and education fields.

Share and Teach could represent a challenge for teaching and learning systems. its development and the online archive full of sharing different didactic materials from all over the world could become a sort of digital heritage. To achieve an optimal use of these technologies, it's important to have a more conscientious approach and to reach a better understanding of technologies-educations relationship.

Nowadays technologies are an important part of day life, even in the field of education but digital natives are experiencing lack of proper instruments to mediate between their perception of reality and the educational standards offered by the school system. From this point of view, Italian teaching staff is behaving in a very innovative way, driven by the desire of educating children as adults of the future, facing every day new challenges and testing educative skills. Spreading technologies inside teaching mean to deal with many barriers, from logistic to intrinsic issue, like the natural obsolescence of every technological device.

It is therefore desirable to increase research efforts in educational technology field, to explore new approaches and generate new push to instruction.

REFERENCES

- Aaron M. (2015) HCI and User-Experience Design, Fast forward to the past, present, and future. Springer.
- Apter J. Michael (1974) *Le nuove tecnologie educative*. Firenze: La Nuova Italia.
- Beauchamp G. e Kennewell S. (2010), *Interactivity in the classroom and its impact on learning*, Computers and Education, vol. 54, pp. 759-766.
- Beeland W.D. Jr (2002), *Student engagement, visual learning and technology: can interactive whiteboards help?*
- Bonaiuti G. (2009), *Didattica attiva con la LIM. Metodologie, strumenti e materiali per la Lavagna Interattiva Multimediale*. Trento: Erickson.
- Cogill J. (2003), *The use of interactive whiteboards in the primary school: effects on pedagogy*. ICT Research Bursaries, BECTA.
- Cuthell J.P. (2003), *Interactive Whiteboards: new tools, new pedagogies? Reflections from teachers*. <http://www.virtuallearning.org.uk/wp-content/uploads/2010/12/Interactive-whiteboard-survey.pdf>.
- Giraldi L., (2017) Il Design delle interfacce: principi e applicazioni progettuali, in Tosi F. a cura di *La professione dell'Ergonomo*. Milano: Francoangeli.
- Johnson M., Ramanair J. e Brine J. (2010), *"It's not necessary to have this board to learn English, but it's helpful": student and teacher perceptions of Interactive Whiteboard use*, Innovation in Language Learning and Teaching, vol. 4, pp. 199- 212.
- Kennewell S. (2006), *Reflections on the interactive whiteboard phenomenon: a synthesis of research from the UK*, The Australian Association for Research in Education. <http://www.aare.edu.au/06pap/ken06138.pdf>.
- Kohler, C. (2008), *Power up*. M Player Edizioni.
- Lewin C., Somekh B., Steadman S. (2008), *Embedding interactive whiteboards in teaching and learning: the process of change in pedagogical practice*. Journal of Education and Information Technologies, vol. 13, pp. 291.
- McGonigal, J. (2011) *La realtà in gioco. Perché i giochi ci rendono migliori e come possono cambiare il mondo*. Milano: Apogeo.
- Nielsen J., Loranger H., (2006) *Web usability 2.0*. Milano, Apogeo.
- Norman D., (2004) *Emotional Design*. Milano: Apogeo.
- Norman, D. A., Verganti, R. (2014). Incremental and radical innovation: Design research versus technology and meaning change. *Design Issues*, 30(1), 78-96.
- Persico D., Midoro V. (2003). *Pedagogia nell'era digitale*. Ortona: Edizioni Menabò.
- Ranieri M. (2011) *Le insidie dell'ovvio. Tecnologia educative e critica della retorica tecnocentrica*. Pisa: Edizioni ETS.
- Rose D.H., Gravel J.W. (2016), *Universal design for Learning: un'introduzione (per l'Italia)*, in G. Savia, *Universal design for learning*. Trento: Erickson
- Sly H., Sieborger I., Hodgkinson-Williams C. (2008), *Interactive Whiteboards: real beauty or just "lipstick"?*, Computers and Education. vol. 51, pp. 1321-1341.
- Tompson, P., (2009). *Doing Visual Research with Children and Young People*. UK: Routledge.
- Türel Y. K. (2011), *An interactive whiteboard student survey: development, validity and reliability*. Computers & Education 57, pp. 2441–2450
- Shawn Lawton H., (2007) *Just ask: Integrating Accessibility throughout Design*. Madison
- Skinner B.F. (1984). *La tecnologia dell'insegnamento*. Brescia: Editrice La Scuola.

Strategies Adopted by Esp Students to Perform Oral Presentations Through Videos

Sandy T. SOTO

*ELT Innovators Research Group
Universidad Técnica de Machala, Ecuador
<http://orcid.org/0000-0003-2314-654X>
stsoto@utmachala.edu.ec*

Estefanía VARGAS CAICEDO

*ELT Innovators Research Group
Universidad de Guayaquil, Ecuador
vargasnestefania@gmail.com*

Maricela CAJAMARCA ILLESCAS

*ELT Innovators Research Group
Universidad Nacional de Educación – UNAE, Ecuador
cajamarcam1@gmail.com
Ecuador*

Ligia Fernanda ESPINOSA

*ELT Innovators Research Group
IKIAM Regional University, Ecuador
ligia.espinosa@ikiam.edu.ec*

Ketty HONORES

*ELT Innovators Research Group
Colegio de Bachillerato Simón de Bolívar, Ecuador
kittyhonores2013@gmail.com*

Tomás FONTAINES-RUIZ

*Universidad Técnica de Machala, Ecuador
tfontaines@utmachala.edu.ec
Venezuela*

ABSTRACT

This work aims at identifying the strategies that generate major differentiation in use among students enrolled in Technical English I and Technical English II, before, during, and after the development of video-based oral presentations. Sixty-nine students took part in the study. They recorded one video per week for over ten weeks. Those students who had recorded at least seven videos were considered for the study. The participants completed a questionnaire that was composed of forty-six Likert Scale items indicating strategies that students could apply before (24 items), during (14 items), and after (8) the recording of the videos. In the questionnaire, students reported the frequency with which they used those strategies. The data was analyzed by conducting an analysis of variance. The results show that the strategies for the recording of videos with significant differentiation in the population under study are the following. Before: the elaboration of storyboards, detailed review of the content, content rehearsal, memorization, and pronunciation of words practice. During: utilization of examples to illustrate ideas, use of mother tongue, repetition strategies, circumlocution, and recording the presentation several times. After: Comparison of their performance in the videos with their performance in previous videos. Students enrolled in Technical English I used more strategies than the ones enrolled in Technical English II. Keywords: ESP students, videos, strategies, self-regulation, oral presentations.

INTRODUCTION

The most difficult skill to master in a foreign language context is the speaking ability due to the lack of exposure that English as a Foreign Language (EFL) students have to a fluent English speaking setting (Allen, 2016; Sarwar, Alam, Hussain, Shah, & Jabeen, 2014). No matter what a wonderful learning environment a teacher creates in their EFL class, whenever students listen to the word: Speaking, they panic. Their anxiety levels rise and they start to hesitate about their abilities (Fahim, 2016). Due to this fact, instructors seek different strategies to enhance students' speaking skills, among the most commonly used ones are video-making and small group projects. Besides improving learners' speaking skills, these activities help teachers reduce learners' stress level since they have an opportunity to practice several times before presenting an oral assessment (Nazhnur, 2016).

Similarly, language learners use different strategies for the development of activities assigned by their teachers or when they are learning the language by themselves. The application of such strategies can be done consciously or unconsciously. For the purpose of this study, the authors have classified the strategies reported in existing literature into two main categories: Speaking strategies used before, during and after the development of oral activities and summarizing and analyzing content strategies.

Speaking strategies

Regarding speaking skills, there have been plenty of studies (Gallagher-Brett, 2007; Zhang & Goh, 2006; Allen, 2016; Fahim, 2016; Nazhnur, 2016) that analyze the strategies selected by students to improve this ability. For instance, it has been reported the use of the following strategies *before* the performance of speaking activities: 1) write prompts as a guide, 2) double check their pronunciation, 3) ask for the help of more knowledgeable people, for example, their family, friends or teacher. 4) say words out aloud before a presentation, 5) imitate spoken materials, 6) spend time working on grammar, 7) speak aloud, 8) speak in their heads, 9) read or watch videos 10) use mind maps as a preparation for their speaking performance, 11) rehearse, 12) repeat, 13) ask questions, 14) draft, 15) use video recordings, and 16) memorize.

The studies conducted by Zhang and Goh (2006), Nazhnur (2016), Yen, Hou, & Chang (2013), Fahim (2016), Karbalaee and Taji (2014), Salehi, Ebrahimi, Sattar & Shojaei (2015), and Rabab'ah (2013) show evidence of the following speaking strategies used by success-oriented students *during* speaking activities: 1) mentally correct verbal errors, 2) pay attention to their grammar, 3) use words with similar meanings in English, 4) use of examples to explain an idea, 5) read from a script, 6) watch themselves speaking English, 7) peer-to-peer correction to enhance their pronunciation and word choice, 8) self-monitoring, 9) switch to the mother tongue, 10) use mimes or gestures, 11) use a circumlocution -an indirect way of saying something, 12) coin words by participants adjusting or approximating the message, 13) word reduction, 14) use of definitions to describe an unknown word, 15) pronunciation awareness, 16) self-repair, and 17) repetition strategies.

In regard to strategies applied *after* students' speaking activities, research indicates that EFL students apply a few strategies. Findings in Fahim (2016) and Yen, et al. (2013) suggest the use of the following strategies in this stage: 1) compare their first and last performance, 2) learn from their mistakes, 3) self-evaluate, and 4) reflect on their speaking experience.

To exemplify the use of strategies for the development of oral performance in language learners in depth, we cite Rabab'ah (2013) and Yen, et al.'s (2013) works. Rabab'ah's (2013) found self-repair and repetition strategies in the oral discourse of German and Jordanian EFL learners who had to retell a story after reading it for an hour. Students used repetition as a resource to obtain a bit more time while retrieving a specific word to carry on with their stories. The participants also applied self-repair strategies when they realized they had made a mistake by adopting a different manner to explain their ideas, yet they were not always successful due to the lack of linguistic resources.

Yen, et al. (2013), on their hand, conducted a study with 42 university students from Taiwan attending to an English conversation course. These learners did a role-play task using Skype where they had to create a business scenario. The procedure was divided into 3 stages: the teacher preparing students for their role-play; practicing the conversation in class small groups; and, a Skype session between classmates performing the activity (role-play). As part of the qualitative results, the researchers noticed the existence of a common theme: peer-to-peer correction. The students helped each other by correcting the pronunciation or eliciting a missing word in their discourse. As a consequence, students learned from their mistakes and helped others notice theirs. The overall result showed this strategy as a meaningful experience that was also supported by the quantitative data which showed a significant improvement in the reduction of speaking errors from the pre-stage to the post-stage.

Summarizing and analyzing content strategies

After reviewing the strategies used by EFL students before, during and after their speaking performance, it is important to present their approaches regarding summarizing and analyzing content. Throughout the analysis of the literature, the following strategies emerged from the research works conducted by Gallagher-Brett (2007), Grünewald, Yang, and Meinel (2013), Marzuki, Prayogo, and Wahyudi (2016): 1) Students go back to their book annotations, but also other media formats, like images, or even links; 2) they interpret, weight and reflect on the content; 3) they participate in discussions and forums; 4) they ask referential questions; 5) explain their reasons and or ideas; 6) answer their friends' questions, and 7) help or ask for help from each other.

The aforementioned sections include a list of commonly used strategies reported by students and registered by researchers in the field when developing speaking activities. In this work, we intend to identify which strategies generated major differentiation in use among students enrolled in two ESP courses (Technical English I and Technical English II), before, during, and after the development of weekly video-based oral presentations. Specifically, the study intends to discover which strategies were significantly preferred inside each group of learners and which learners, whether those enrolled Technical English I or the ones enrolled in Technical English II, used more strategies for the accomplishment of the speaking task assigned week after week.

METHODOLOGY

Setting, Participants, and intervention process

The study was conducted at a public university in Ecuador, during the first academic semester (May-September) of the 2017-2018 school year. The participants of the study were 69 out of 94 students enrolled in the Technical English I (42 students) and Technical English II (27 students) courses offered in the Business Management major. 40 were female and 29 were male. The participants' average age was 22.10, ranging from 20 to 30 years old. The students participated in the study voluntarily.

The participants developed one video per week for over ten weeks, between May and part of July 2017. In the videos, which were the outcome of their autonomous work, the participants recorded themselves performing an oral presentation of the content they studied in class in the previous week. The content of the video-based oral presentations consisted of the description of key concepts studied in class. Students who had developed at least seven videos up to when the data was collected we asked to volunteer for the study. This was the first time that both groups of learners developed this task.

Data collection period, Instrument, and analysis procedure

Data were collected between the last week of July and the first week of August 2017. A structured questionnaire was developed to identify the strategies that generated major differentiation in use among the participants of the study, before, during, and after the recording of the video-based oral presentations. The questionnaire was composed of items that asked about participants' age and gender and three Likert scales (see Tables 1, 2, and 3).

The three Likert scales contained items that required participants to indicate how often (*always, sometimes, rarely, or never*) they applied a set of strategies of self-regulatory nature before (24 strategies), during (14 strategies), and after (8 strategies) the recording of their video-based oral presentations. The participants completed the questionnaire via Google forms. Three external researchers validated the instrument. They revised it and reported the effectiveness of each item. Items were removed or restated, depending on the suggestions of the experts. The data were analyzed by conducting an Analysis of Variance using the IBM statistical software SPSS 22.0.

Ethical considerations

Informed consent was taken from the participants to assure the compliance with ethical protocols. Anonymity of participants' identity was guaranteed by having students complete the instruments without including their names on them.

Table 1: Pre-video recording strategies

N	To do the oral presentations through the videos:	Always	Sometimes	Rarely	Never
1	I pay attention to the way my teacher or other good speakers of English express themselves.				
2	I take notes about what is being explained in class.				
3	I make sure that my notes are clear and correct.				
4	I question my teacher about the material presented in class.				
5	I identify key ideas of the content studied in class.				
6	I review the content studied in class meticulously.				
7	I investigate about the topics studied in class in sources other than the ones provided in class.				
8	I organize the ideas of the content I am going to explain in the videos.				
9	I create a storyboard (outline in pictures) of my presentation.				
10	I ask for the help of more knowledgeable people (peers, family, friends, teacher, etc.) to organize the material/content of my presentation.				
11	I do a benchmark of what I am going to present with other classmates.				
12	I present a draft of what I am going to present to the teacher before recording my video presentation.				
13	I write scripts about what I am going to say in the video directly in English.				
14	I write scripts about what I am going to say in the video in Spanish and then translate them into English.				
15	I plan my performance in the video.				

- 16 I rehearse what I am going to explain in the presentation.
- 17 I memorize part of what I am going to say in the video.
- 18 I memorize everything I am going to say in the video.
- 19 I practice the pronunciation of words.
- 20 I double check the pronunciation of words.
- 21 I ask more knowledgeable peers to evaluate my presentation before I record it.
- 22 I simulate presentations to control timing.
- 23 I run simulation presentations to evaluate my speech and the clarity on my subject.
- 24 I make changes based on the simulated presentations.

Table 2. During-video recording strategies

N	While I video record the oral presentations:	Always	Sometimes	Rarely	Never
1	I mentally correct grammar, vocabulary, or pronunciation errors.				
2	I monitor (ask myself whether what I am doing is correct or not, whether it makes sense or not, whether I am reaching the objective of my presentation, whether I need to change something) the progress of my presentation.				
3	I have other people to monitor my presentation.				
4	I use examples to illustrate my ideas.				
5	I use definitions to describe words.				
6	I use mimes and gestures to make myself clear.				
7	I use self-repair to make ideas clear.				
8	I read from a script.				
9	I use synonyms when I forget some words.				
10	I switch to my mother tongue when I forget something.				
11	I improvise when I forget certain ideas.				
12	I use repetition strategies when I forget something.				
13	I use circumlocution to explain things.				
14	I record my presentation several times until I feel it is				

ready.

Table 3. Post-video recording strategies

N	After I video record the oral presentations:	Always	Sometimes	Rarely	Never
1	I self-evaluate my presentations.				
2	I have more knowledgeable people (peers, friends, family, etc.) to evaluate my performance in the presentations.				
3	I list the pronunciation mistakes I have made in the videos.				
4	I list the vocabulary mistakes I have made in the videos.				
5	I list the grammar mistakes I have made in the videos.				
6	I compare my performance in the videos with my performance in previous videos.				
7	I compare my performance in my videos with the performance of my peers in their videos.				
8	I reflect on my speaking experience through the video presentations.				

RESULTS

We performed an analysis of variance to a set of forty-six self-regulatory strategies that students used before, during, and after the production of their video-based oral presentations. The ANOVA enabled the identification of those strategies that produced a significant difference for the two groups of participants as reported in the F values and Degree of Significance for each group of strategies (see Tables 4, 5, and 6).

Table 4. ANOVA of pre-video recording strategies

Groups	Strategies	Sum of squares	df	Mean square	F	Sig.
Technical English I	Reviewing the content studied in class meticulously.	6,117	6	1,019	3,404	,010
	Rehearsing what is going to be explained in the presentation.	2,792	6	,465	2,483	,043
	Memorizing of part of what is going to be said in the video.	9,500	6	1,583	3,507	,009
	Practicing the pronunciation of words.	4,950	6	,825	2,486	,043
Technical English II	Creating of a storyboard (outline in pictures) of the presentation.	11,744	5	2,349	2,915	,038

From the set of twenty-four pre-video recording strategies, we could identify that the strategies that caused higher differentiation in the learners enrolled in Technical English I are associated with the detailed revision of the content that students learned in class; rehearsal of what is going to be explained in the video; memorization of certain parts that will be discussed; and, practice the correct way to say words. On the other hand, the responses of students enrolled in Technical English II showed an important tendency of this group towards the creation of storyboards (outline in pictures) of their presentations before developing their task.

We can clearly see that students enrolled in the beginning course (Technical English I) required more preparation prior to producing the task, therefore, resorting to more self-regulation strategies; this confirms the findings of Gallagher-Brett (2007) and Zhang & Goh (2006). The need for more strategies is acceptable as students have a low command of the language, implying that they need more practice before their final outcome is produced, and even requiring memorization. On the contrary, students with a higher command of English used fewer strategies (one in this case). This is in tune with Griffiths' (2003) findings, who determined that New Zealand language learners with a low proficiency level used more social, cognitive, compensation, and metacognitive learning strategies than those learners who held a higher English proficiency level. A possible explanation for this event can be the learners' level of confidence in regards to their English knowledge, command of the content, and capability to do the task.

Table 5. ANOVA of during-video recording strategies

Groups	Strategies	Sum of squares	df	Mean square	F	Sig.
Technical English I	Recording the presentation several times until feeling it is ready.	9,292	6	1,549	2,735	,029
	Using examples to illustrate ideas.	7,467	5	1,493	2,977	,035
Technical English II	Reading from a script.	19,467	5	3,893	7,300	,000
	Switching to one's mother tongue when something is forgotten.	8,374	5	1,675	3,800	,013
	Using repetition strategies when something is forgotten.	8,207	5	1,641	2,611	,055
	Using circumlocution to explain things.	8,411	5	1,682	3,684	,015

Regarding the strategies used by the learners during the recording of their video-based oral presentations, we found that out of the fourteen self-regulation strategies selected for this study, recording the presentation several times until feeling it is ready is the strategy that caused a significant differentiation in students enrolled in Technical English I. We believe that students have a high inclination towards this strategy due to their English proficiency level. Since they have a poor knowledge of English, they need more time to develop the task appropriately and the tiniest mistakes or knowledge gaps can cause them to repeat it. Another possible explanation for this finding could be, as reported by Zhang & Goh (2006), student lack of knowledge about how to use strategies in this phase.

Using examples to illustrate ideas; reading from a script; switching to their mother tongue and using repetition strategies when they forget something, and using circumlocution to explain things are the strategies that according to the statistical analysis of the students' responses generated a significant differentiation in students enrolled in the Technical English II course. Conversely to the results reported for this group of students in the pre-video recording strategies, in this stage of the development of the task we notice that students use a higher number of strategies. Again, we attribute part of this outcome to the English proficiency knowledge of students. Due to they have more command of the language, they have more linguistic resources to illustrate or explain their ideas. In this case, we see students' recurrence in use of supporting materials (scripts) which is certain sense is negative. It denotes students need for pre-video recording strategies more consistently.

Table 6. ANOVA of post-video recording strategies

Groups	Strategies	Sum of squares	df	Mean square	F	Sig.
Technical English I	Comparing one's performance in the videos with his/her performance in previous videos.	15,008	6	2,501	2,952	,020

Similar to Fahim (2016) and Yen, et al.'s (2013) findings, after the development of their tasks, language learners who participated in this study showed the fewer use of self-regulation strategies. However, as seen in Table 6, the responses of learners enrolled in the Technical English course indicated a high level of significance in regards to the comparison of their performance in the videos with their performance in previous videos. We believe that this group of students tend to compare their performance as they need to self-evaluate their outcomes to develop the task appropriately. Their need for comparing their production is closely connected to the tendency of this group to recording their presentations several times until feeling they are ready, which was reported as a highly significant strategy during the recording of their video-based oral presentations. The responses of students enrolled in the Technical English II course showed no relevant differentiation in the strategies evaluated.

CONCLUSIONS

The purpose of this study was to identify the strategies that generated major differentiation in use among students enrolled in Technical English I and Technical English II, before, during, and after the development of video-based oral presentations. The results of the study bring us to conclude that the strategies that generated major differentiation in use in both groups of language learners depend on their command of the learners.

Students with a higher level of English (Technical English II) strive less to prepare for the oral presentations. But, they apply more strategies while recording the video. This result illustrates that students feel more confident to perform the oral presentations, therefore, they mainly create storyboards to follow their presentations. On the opposite, students with a lower level of English (Technical English I) struggle more to prepare for the oral presentations. Their English level forces them to do more things (apply more self-regulated strategies) to perform well in the task.

Regarding the strategies applied during the recording of the videos, low proficiency level learners take more time to submit their final product as they repeat their videos many times. This, in turn, prompts these learners to develop a sense of self-evaluation as they feel the need to compare the progression of their performance in their own videos. Foreign language teachers should consider these findings in order to support the learning process of their students. They should also reflect upon whether learners do not use certain learning strategies with high concurrence due to their lack of knowledge about how to use them or not. If the answer is yes, then they should seek for ways to teach students to use those strategies, therefore, inducing them to take ownership of their learning process and become autonomous learners.

REFERENCES

- Allen, D. (2016). Investigating washback to the learner from the IELTS test in the Japanese tertiary context. *Language Testing in Asia*, 6(7), 1-20. doi: 10.1186/s40468-016-0030-z
- Fahim, S. (2016). Self-Regulated Strategy Instruction for Developing Speaking Proficiency and Reducing Speaking Anxiety of Egyptian University Students. *English Language Teaching*, 9(12), 22-33. doi:10.5539/elt.v9n12p22
- Gallagher-Brett, A. (2007) What do learners' beliefs about speaking reveal about their awareness of learning strategies?. *The Language Learning Journal*, 35(1), 37-49. doi: 10.1080/09571730701315675
- Griffiths, C. (2003). *Language learning strategy use and proficiency: The relationship between patterns of reported language learning strategy (LLS) use by speakers of other languages (SOS) and proficiency with implications for the teaching/learning situation* (Unpublished doctoral dissertation). University of Auckland, New Zealand.
- Grünewald, F., Yang, H., & Meinel, C. (2013). Evaluating the digital manuscript functionality – User testing for lecture video annotation features. In JF. Wang & R. Lau (Eds.), *Lecture Notes in Computer Science: Vol 8167. Advances in Web-Based Learning – ICWL 2013* (pp.214-223). doi: https://doi.org/10.1007/978-3-642-41175-5_22
- Karbalaei, A. & Taji, T. (2014). Compensation strategies: Tracking movement in EFL learners' speaking skills. *Gist Education and Learning Research Journal*, 9(2), pp. 88-102.
- Marzuki, Prayogo, J. & Wahyudi, A. (2016). Improving the EFL learners' speaking ability through interactive storytelling. *DINAMIKA ILMU*, 16(1), 15-34.
- Nazhnur, G. (2016). Examining the effectiveness of digital video recordings on oral performance of EFL learners. *Teaching English with Technology*, 16(2), 71-96. Retrieved from <http://www.tewtjournal.org>

- Rabab'ah, G., (2013). Strategies of repair in EFL learners' oral discourse. *English Language Teaching*, 6(6), 123-131. doi:10.5539/elt.v6n6p123
- Salehi, H., Ebrahimi, M., Sattar, S., & Shojaee, M. (2015). Relationship between EFL learners' autonomy and speaking strategies they use in conversation classes. *Advances in Language and Literary Studies*; 6(2), 37-43. doi:10.7575/aiac.all.v.6n.2p.37
- Sarwar, M., Alam, M., Hussain, S., Shah, A., & Jabeen, M. (2014). Assessing English speaking skills of prospective teachers at entry and graduation level in teacher education program. *Language Testing in Asia*, 4(5), 1-9.
- Yen, Y.C., Hou, H.T., & Chang, K.E. (2013). Applying skype in English as a foreign language instruction: Effect on students' speaking errors. In JF. Wang & R. Lau (Eds.), *Lecture Notes in Computer Science: Vol 8167. Advances in Web-Based Learning – ICWL 2013* (pp. 312-319). doi: https://doi.org/10.1007/978-3-642-41175-5_32
- Zhang, D. & Goh, C. (2006). Strategy knowledge and perceived strategy use: Singaporean students' awareness of listening and speaking strategies. *Language Awareness*, 15(3), 199-119. doi: 10.2167/la342.0

Study on the Capacity and Readiness to Implement Information Technology of Personnel in Higher Educational Institutions to Drive Thailand's Education Reform 4.0

Sasichai TANAMAI

*Educational Technology Department,
Faculty of Education,
Kasetsart University, Thailand.
Sasichai.t@ku.ac.th*

ABSTRACT

Capacity and readiness to implement Information and Communication Technology (ICT) of personnel of higher educational institutions is a mixed methods research of documentary research. This study, also covering the trends of capacity, readiness, obstacles, challenges, and development potentials of the personnel in such matter to drive Thailand's education reform in 4.0, employed a sample of 100 academic support staff of higher educational institutions. The findings are: 1. The trend of ICT applications in daily operations of personnel of higher education institutions was at a moderate level ($\bar{x} = 2.71$), of which software package applications being the highest, followed by information search on the Internet; 2. Personnel of higher education institutions was at a moderate capacity and readiness ($\bar{x} = 3.43$), high in information literacy, and moderate in ICT literacy and Internet media awareness. The obstacles and challenges presented in the implementation of ICT among the personnel were low ($\bar{x} = 2.41$), and 3. ICT capacity and readiness development guidelines for personnel of higher education institutions to drive Thailand's education 4.0 are conception of ICT master plans, provision of ICT equipment, funding, and personnel. Personnel should be educated for proficient utilization of ICT.

INTRODUCTION

At present, information and communication technology (ICT) plays a vital role in all aspects of people's lives and at all levels, affecting individuals, public and private organizations and nations. ICT contributes to creating better quality of life and greater convenience, as well as being an instrument of all kinds of development. ICT also generates a country's wealth and improves its competitive edges over other countries. Therefore, countries around the world, whether developing or developed, need to be capable of effective ICT management in order to have the capability and capacity to use ICT to compete against other countries. Porter (1985) stated that in order to increase the capacity and capability of a country, importance must be placed on ICT as one of the factors affecting competition.

Therefore, it cannot be denied that modern ICT is considerably essential for the development of a country and it tends to become more and more crucial in the future as the world becomes smaller thanks to the advancement in communication technology. The world has become borderless and people around the world are able to communicate swiftly, leading to development and changes to the economy, society, politics and culture, as well as the application of ICT to modern educational system. ICT is also the driving force behind the country becoming a knowledge-based society and economy. Thus, ICT literacy is an important trend for future changes and individuals must possess ICT knowledge and understanding so that they can effectively use it in practice to increase the country's competitiveness.

In order to achieve Education Reform 4.0, it is important that new skill sets are developed to prepare personnel for the dynamics of the 21st century. Skills that have gain more importance in the 21st century are cognitive abilities, systems skills, complex problem solving, content skills and process skills.

While setting the direction toward the achievement of Education Reform 4.0, apart from considering the capacity and readiness of students and instructors, higher educational institutions must consider whether their personnel, especially academic support personnel, have the capacity and readiness to implement ICT in performing their work or providing support for teaching and classes in order to drive Education Reform 4.0.

Due to the aforementioned, I am interested in studying the ICT capacity and readiness of higher educational institution personnel to drive Education Reform 4.0.

RESEARCH OBJECTIVES

1. To examine the state of ICT usage of personnel in higher educational institutions
2. To examine the capacity, readiness, problems and obstacles relating to ICT usage of personnel in higher educational institutions
3. To provide guidelines for the preparation of personnel in higher educational institutions for the implementation of ICT to drive Education Reform 4.0

SAMPLE GROUP

The sample group in this research consists of 100 personnel in the field of academic support, working in Faculty of Education of 10 public higher educational institutions. They were selected using cluster sampling.

RESULTS

The results of the study on capacity and readiness to implement ICT to drive Education Reform 4.0 of personnel in higher educational institutions are summarized below:

1. The analysis of the state of ICT usage among personnel in higher educational institutions revealed the followings [Figure 1]:

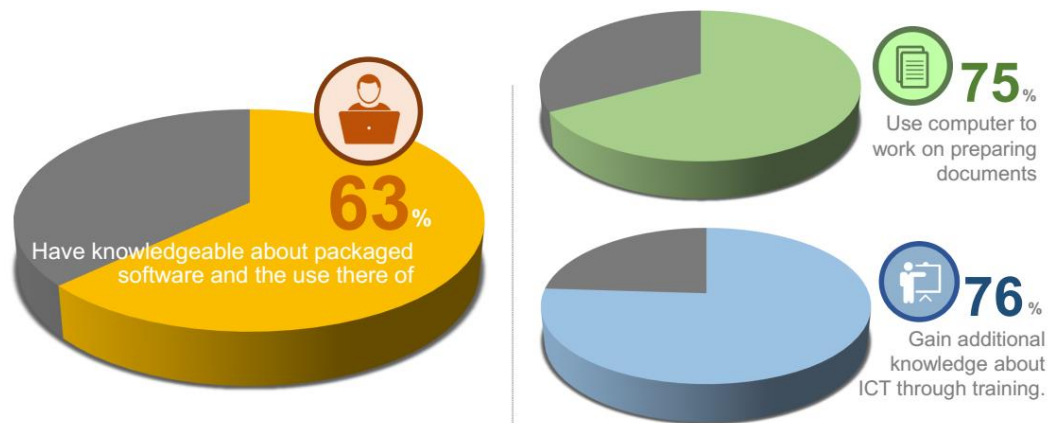


Figure 1 : The state of ICT usage among personnel in higher educational institutions

More than half (63.0%) of the individuals in the sample group are most knowledgeable about packaged software and the use thereof. The majority (75.0%) use computer to work on preparing documents. It is also found that the majority (76.0%) gain additional knowledge about ICT through training.

As for the state of ICT usage, it is found that the level of overall ICT usage for work among the sample group is moderate ($\bar{x} = 2.71$) [Figure 2].

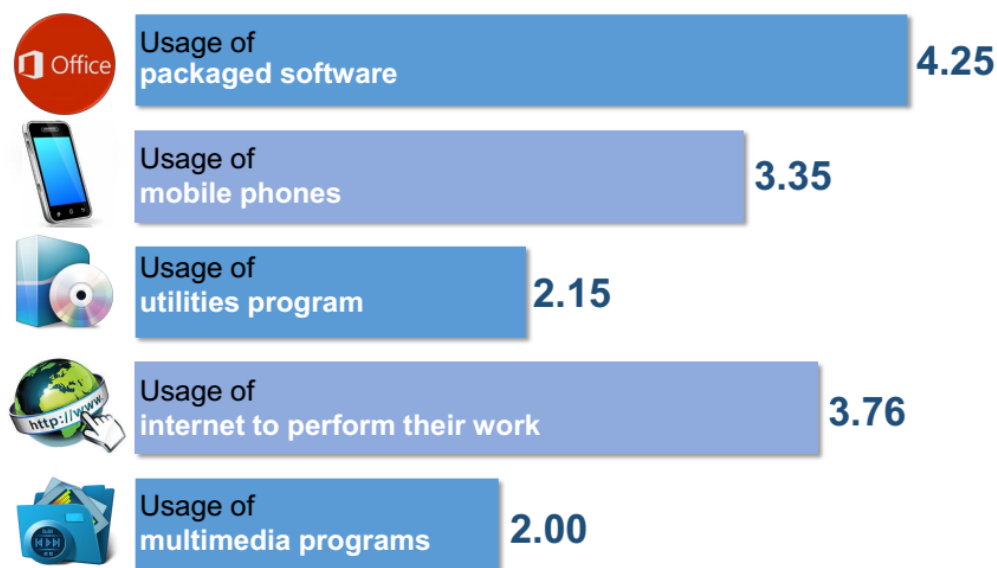


Figure 2 : The level of overall ICT usage for work among the sample group

High level of packaged software, e.g. MS Office including MS Word, MS Excel, MS PowerPoint and MS Access, is found ($\bar{x} = 4.25$). The usage of internet to perform their work, such as information retrieval, internet connection, using e-mail, is also high ($\bar{x} = 3.76$). The use of mobile phones to take photos, record videos and sound, send/receive image files, as well as using search engines, e.g. Google and Yahoo, for work is moderate ($\bar{x} = 3.35$). Low usage level is found in the use of utilities program such as WinZip and Antivirus ($\bar{x} = 2.15$) and multimedia programs such as Windows Media Player ($\bar{x} = 2.00$).

It is also found that approximately half of the personnel in higher educational institutions (52.0%) have moderate knowledge about Education Reform 4.0 and the majority (77.0%) stated that they are ready to implement ICT to drive Education Reform 4.0.

2. The analysis of capacity and readiness to implement ICT, ICT literacy, information literacy and media literacy of personnel in higher educational institutions revealed results as summarized below [Figure 3]:

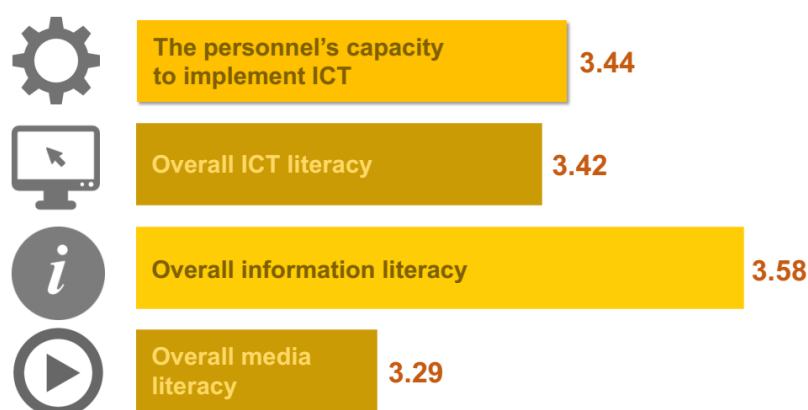


Figure 3 : The capacity and readiness to implement ICT

2.5 Comparing the results of males and females, it is found that the overall capacity and readiness to implement ICT, ICT literacy and media literacy differ significantly between the two genders ($p < 0.05$).

2.6 Comparing the results of groups divided by level of education, It is found that the overall capacity to use ICT of individuals with bachelor's degree and those with graduate degrees differ significantly ($p < 0.05$). The information literacy of the two groups is also significantly different ($p < 0.05$).

2.7 Upon comparing the variance of capacity and readiness to implement ICT, ICT literacy, information literacy and media literacy between age groups, it is found that the personnel's overall capacity to implement ITC is significantly different ($p < 0.05$). It is also found the capacity to implement ICT of those who are 46 years old or older is significantly different from those who are 35 years old or younger or those between 36-45 years old. The ICT literacy of the 46+ age group is also significantly different from those who are 35 years old or younger. Information literacy and media literacy of 46+ age group is different from the 36-45 age group.

2.8 Upon comparing the variance of capacity to implement ICT, ICT literacy, information literacy and media literacy between groups with different job duration, it is found that there is no significant difference.

3. Issues and obstacles to the implementation of ICT

It is found that in general, the level of issues and obstacles to the implementation of ICT among personnel in higher educational institutions is low ($\bar{x} = 2.41$). When considering each aspect separately, the level of issues and obstacles is low in all aspects.

4. The following guideline for the preparation of ICT implementation to drive Education Reform 4.0 is extracted from the information gathered.

4.1 Each institution should devise its ICT master plan and use it as the guideline for ICT operation and management.

4.2 Each institution should have all the ICT equipment necessary for its operation available. Regular maintenance and upgrade should be performed so that the equipment is able to support the operation continually and effectively.

4.3 Budget should be allocated for the development of the institution's ICT to increase the agility and effectiveness of its operation.

4.4 The personnel's ICT competency should be developed in the following aspects:

1) Knowledge: The personnel should have the basic knowledge including ICT basic knowledge such as that about internet and computer usage, knowledge and understanding of communication technologies such as mobile phones, knowledge and understanding of referencing, etc.

2) Skills: The personnel should have the skills relating to information and internet usage, able to distinguish between true and false information and have the required expertise to use packaged software necessary for work, etc.

3) Attitude: The personnel should have favorable attitude toward ICT, make an effort to resolve issues accompanying the use of technology and keep themselves up-to-date with the advancement of ICT, etc.

4.5 The institution should be prepared for changes, for instance, in order to prepare for the changes caused by Education Reform 4.0, the leaders or the management of the institution must be prepared to provide information and share knowledge relating to such changes.

DISCUSSION

Findings from researching on capacity and readiness to implement ICT of personnel in higher educational institutions are discussed below:

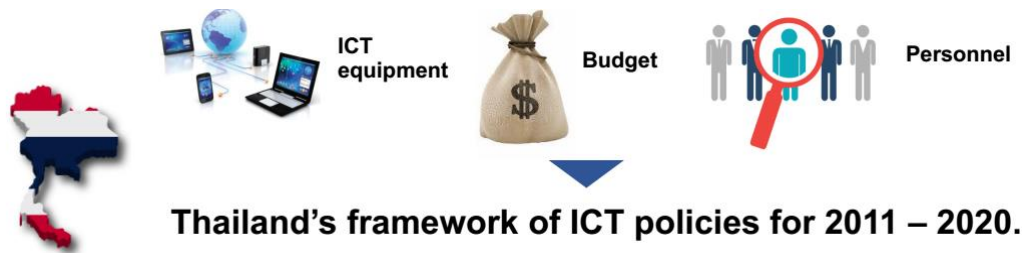


Figure 4 : Guideline for preparation to ICT implementation

1. The analysis of the state of ICT implementation in institutions of higher education revealed that the overall ICT usage level is moderate and the institutions, especially those in the fields relating to social science, have not fully utilized ICT. One of the reasons could be that the nature of such fields requires minimal use of ICT in classes. As most of the personnel only use packaged software, e.g. MS Office, and only use ICT for working on documents, to prepare them for external changes, e.g. Education Reform 4.0, the management should place importance on extending the personnel's knowledge on new technologies and increasing their ability to create innovation. The emphasis should be placed on universal technologies that allow the personnel to communicate with people around the world. It is also found that the majority of the personnel think that training is the most suitable way to acquire more ICT knowledge.

2. According to the analysis of the capacity to implement ICT, ICT literacy, information literacy and media literacy of personnel in higher educational institutions, their capacity is moderate, reflecting that they have not fully implemented ICT. This finding is in line with Doyle (1994)'s notion that the development of personal should start with realizing the potential of each individual and figuring out how to optimally use the individual's capability in the way that is most beneficial to the organization. Considering aspect by aspect, it is found that:

2.1 ICT literacy: although the personnel's overall knowledge about ICT is moderate, they possess good skills in identifying which communication device to use, be it computers or mobile phones. The personnel are capable of identifying which type of task is suitable for each device; accessing, retrieving and storing data, as well as assessing whether the information retrieved by using such communication devices is accurate and up-to-date. These are considered important for doing the job. This is in line with Horton (2008)'s statement on the importance of ICT on education that modern education relies on data retrieved and stored for using in planning, operating, monitoring and assessment. It is also found that male personnel have better ICT literacy comparing to the female counterparts. The reason could be that males are more courageous in learning and trying new things by trial and error. It is also found that age group is a differentiating factor. Those who are 46 years old or older have lower ICT literacy comparing to those who are 35 years old or younger. The reason could be that older people have more difficulties in learning ICT comparing to the young due to physical condition, clarity of vision, hand dexterity and the ability to develop their brain to cope with new and changing technologies.

2.2 Information Literacy: It is found that the personnel have high information literacy, especially data retrieval and information usage skills. They know how to retrieve data and how to apply them to generate new knowledge. This is in line with Horton, Jr., F.W. (2008) notion that the society needs individuals who are capable of searching for, assessing, analyzing, and processing, managing and relaying information to others effectively and efficiently. SUNY Council of Library Directors Information Literacy Initiative (2003) also stated that one of the characteristics of an ICT literate is the ability to develop strategies for information retrieval and getting access to the source of information, as well as selecting information to generate new knowledge from.

Furthermore, it is found that personnel with a bachelor's degree possess higher ICT literacy comparing to those with a graduate degree because those with lower level of education need to rely on themselves in learning new things and ICT literacy results in self-learning process.

The finding is similar to Association of College & Research Libraries (2000)'s view that ICT literacy is beneficial for individuals in many ways including creating self-learning environment and allowing the individuals to raise clear questions, develop critical and rational thinking. Information literacy is also considered lifelong learning.

2.3 Media Literacy: It is found that the personnel's overall media literacy is moderate. This is considered a good starting point for further development of media literacy as internet is currently an extremely important media. The findings revealed that the personnel possess good skill in setting a clear goal before using the internet, they think before referencing the data found on websites while doing their job and they are able to share their views and opinions on social media. This is in line with Bazalgette (2007)'s view that media literate persons are able to analyze the techniques, language and format employed by the media to relay the message. It is also found that media literacy of male and female personnel differs significantly, similar to the findings of Buckingham et. al (2005) and Livingstone et. al. (2007) that gender is a significant factor that correlates with the level of skills based on the personnel's access to media. For example, males have higher chance of creating content on websites and social communities than females.

In the same way, it is found that age is another significant factor for media literacy. Those who are 46 years old or older possess less media literacy comparing to those who are 35 years old or younger and those who are between 36-45 years old. Buckingham et. al. (2005) and Livingstone et. al. (2007) found that age is a factor that affects the personnel's access and response to media. The older group has less access to new media comparing to the younger groups but they have better critical understanding of the media.

3. In general, there are not many issues and obstacles to ICT implementation. Frequent issues include the inconvenience caused by using intranet/internet, available hi-tech devices being ineffective, computers infected by virus, the lack of opportunities to acquire more ICT knowledge and the lack of institution's emphasis on the implementation of ICT within the organization. Consistent with Whittaker's research (cited UNESCO, 2003), it is found that one of the main reasons of failures or mistakes relating to ICT implementation is the use technology not suitable for the needs of the organization. The problems found in this study should be resolved by the institution's top executives. Whittaker stated that the confidence instilled by the top executives is considered a major and crucial contribution to successful ICT implementation within the organization.

4. The management of higher educational institutions gives priority to the development of ICT master plan which gives positive contribution to the execution of such plan. This is in line with Chakravarty (2008)'s view that good practice of educational system development requires clear ICT policies and strategies, which are integrated into the whole educational system, and the promotion of ICT skills. Once there is a clear master plan and the institution is ready in terms of ICT equipment, budget and personnel, the implementation should be successful. As for the personnel, it is important that their ICT competencies are developed so that they can use ICT creatively and effectively, and possess good judgment and knowledge about ICT. The ICT personnel should also be developed to have the knowledge, capability and expertise at the internationally accepted level, in line with human capital development strategy within the framework of ICT policies for 2011 – 2020.

SUGGESTIONS

1. Educational institutions should prepare their personnel of all levels including the management, information technology officers, experts and operation officers; for the implementation of ICT by providing training courses or lectures so that they have the knowledge, skills and understanding of the potential and capability of ICT.
2. Knowledge exchange/community of practice/group activities should be organized to promote ICT to personnel, focusing on sharing useful tips, tricks and techniques.

3. The institutions should promote self-learning and co-working to create harmony within the organization.
4. The educational institutions should organize regular and continuous personnel development plan, so that their personnel can acquire the skills, knowledge and techniques that are necessary for doing their jobs. Examples are seminars, study trip and further education, etc.
5. ICT should be used to enhance the effectiveness of educational management and the provision of educational services. The institutions should develop software for the purpose of providing core services according to their missions at all levels, for example, e-Registration, e-Counseling, e-Testing, e-Loan, etc.

REFERENCES

- Buckingham, D., Banaji, S., Carr, D., Cranmer, S., & Willett, R. (2005). The media literacy of children and young people: A review of the research literature. Project Report. OFCOM, London.
- Bundy, A. (2002). Growing the Community of the Informed: Information Literacy – A Global Issue. *Australian Academic and Research Libraries* 33, 3 (2002): 125-134.
- Center for media Literacy. (2008). Literacy for the 21st century: An overview & Orientation guide to media literacy education (2nd ed.). Malibu, CA: Center for Media Literacy.
- Chakravarty, Rupak . (2008). Information literacy in the knowledge society : empowering learners for a better tomorrow., . In *Trends and Strategic Issues for Libraries in Global Information Society*, Chandigarh, India, 18-19 March 2008.
- Commission on Information and Communication Technology. (2010). National ICT Competency Standard (NICS) Basic. [online]. Available from: <http://www.ncc.gov.ph/nics/files/NICS-Basic.pdf>. [2014, August 18].
- Doyle, Christina S. (1994). Information Literacy in an Information Society: A Concept for the Information Age. New York: ERIC Clearinghouse on Information and Technology Syracuse University.
- Horton, Jr., F.W. (2008). Understanding Information Literacy: A Power. Paris: UNESCO. Conference of the International Association of Educational Assessment (IAEA), Philadelphia, PA, June 13-18, 2004. [online] Available from: <http://www.est.org/iaea> [2014 , February 12].
- Livingstone, S., Van Couvering, E., & Thumim, N. (2005). Adult media literacy: a review of the research literature. London, UK: Department of Media and communications, London School of Economics and Political Science.
- MCEETYA Performance Measurement and Reporting Taskforce. (2005). National Assessment Program Information and Communication Technology Literacy 2005 Years 6 and 10 An Assessment Domain for ICT Literacy. [online]. Available from: http://www.iste.org/Libraries/PDFs/Australia_ICT_Assessment.sflb.ashx [2014, May 8].
- Porter, M.E. (1985). *Competitive advantage: creating and sustaining superior performance*. New York: Free Press.
- Potter, W. J. (2005). *Media literacy*. Thousand Oaks: Sage.
- RobbGireco, M. 2007. Resources in School of Communications and Theater TEMPLE UNIVERSITY. Media literacy as an independent and interactive variable in the knowledge gap hypothesis. Media Education Lap Working Paper Series. Available From: http://www.mediaeducationlap.com/sites/mediaeducationlap.com/files/202_WorkingPapers_RobbGrieco.pdf. [2013, November 25].
- SUNY Council of Library Directors. (2003). *Information Literacy Initiative*. [online]. Available From: <http://www.sunyconnectsunny.edu/ili/final.htm>. [2013, November 22].
- The International ICT Literacy Panel. (2002). “Digital Transformation : A Framework for ICT Literacy”. U.S.A.: Educational Testing Service (ETS).
- UNESCO. (2007). *Understanding Information Literacy: A Primer*. Edited by the Information Society Division, Communication and Information Sector Paris: UNESCO, 2007. – vill, 94 p, 21 cm.

Tax Education Program for Teachers in High Schools to Enhance Voluntary Tax Compliance

Sutrisno

*Department of Fiscal Administration Science, Faculty of Administration Science,
University of Indonesia, Depok, Indonesia*
sutrisno_trisno92@yahoo.co.id

Milla Sepliana SETYOWATI

*Department of Fiscal Administration Science, Faculty of Administration Science,
University of Indonesia, Depok, Indonesia*
milla.s.setyowati@gmail.com

ABSTRACT

This paper analyzed implementation of tax socialization program for teachers in high schools in the Regional Office of West Java II Directorate General Taxation from content and context of policy perspective. This study discusses tax socialization program as an effort to educate the elements shaping taxpayers' behaviors which are tax mentality, tax tension feeling, and tax morale. This program aimed at promoting teachers as the agents of socialization and the agents of change to instill knowledge and an awareness of tax responsibility to students as teachers are seen as respected figures by students. Tax education program is a long-term investment that needs to be introduced as early as possible to shape the behaviors of taxpayers which in turn, may enhance voluntary tax compliance from students as the future taxpayers.

Keywords: *tax socialization, policy implementation, agent of change, voluntary tax compliance.*

INTRODUCTION

Taxation is main income of government and its success depends on the taxpayers. The amount of tax gained is influenced by the compliance of taxpayers in fulfilling their taxation obligation (Simanjuntak, 2012). At the moment, there are still many uncollected tax potentials due to taxpayers' low level of tax compliance. The percentage of taxpayer compliance in Indonesia is still low. In 2016, from around 118 million work labour, registered tax payers only 36 million, and only 10,9 million (30,35%) paid their taxes or submitted their annual income tax return forms.

Tax compliance is influenced by two factors: external and internal factors. The experts in economics explain that there is a clear relationship between the external factors such as tax rate, income, audit and penalties to tax compliance. Meanwhile, research in psychology shows that both internal factors and external factors influence the tax compliance (Hofmann, 2008). According to Mohdali (2012), the main factor that influences tax compliance is not the economic factors (the external factors), but the effects of the government actions and the tax authority response towards taxpayers as the internal factor. There are three elements forming taxpayers' behavior that are tax mentality, tax tension feeling, and tax morale.

To improve taxpayers' behavior so that they possess voluntary tax compliance is through tax socialization. As a tax education effort, tax socialization enables taxpayers to possess adequate knowledge and understanding on the rights and procedures for fulfilling tax obligations (Winartati & Setyowati, 2016). This is related to adoption of the self-assessment system in Indonesia's taxation administration which requires the taxpayers to report their taxation obligation independently. It is hoped that tax education program may enhance voluntary of compliance from taxpayers.

The Directorate General of Taxation (DGT) is implementing the tax education program by introducing various socialization programs whose objectives are to provide counselling on and to promote the tax education program, and one program specially introduced by the DGT to enhance voluntary compliance is the tax socialization program. This program is given not only to the current taxpayers but also to prospective taxpayers such as students in high schools or equivalent. At the moment, before targeting students, tax socialization program is given to teachers in high schools or equivalent as a third party. Tax socialization program for the teachers in high schools or equivalent is currently implemented by the Counselling, Service, and Public Relation Section in the Regional Office of West Java II DGT.

This paper discusses the basis for implementation of tax socialization for teachers in high schools or equivalent, for teachers in the Regional Office of West Java II DGT, and the roles of tax socialization for teachers in the Regional Office of West Java II DGT seen from the elements shaping the behaviors of taxpayers.

THEORETICAL REVIEW

Tax policy is government instrument in taxation which has a certain target or is implemented to reach a certain objective in social and economic field. Tax policy may support the economic and social development of a country (Devano, 2006). One of tax policies is tax socialization. Berger, as cited by Sunarto (2004), defines socialization as a process by which a child learns to be a participating member of society.

Tax socialization program is given to taxpayers and prospective taxpayers. Socialization is given to taxpayers so that they understand and are able to exercise their rights and fulfill their taxation obligation according to the applicable taxation regulations. Meanwhile, socialization to the prospective taxpayers aims at introducing taxation and providing an understanding to the next generation of the importance of taxation so that once they become taxpayers in the future, they will understand and dutifully fulfill their obligation (Directorate General of Taxation, 2012).

As a policy, to achieve its goals, tax socialization is carried out in the form of a program. Nugroho (2004) stated that to reach its goal, the policy needs to be implemented. Grindle (2008) explains that generally, process of implementation can start when the general objectives and aims have been set, the program actions have been designed, and the budget has been allocated for achieving the goals. In the program actions, there are two factors that influence the implementation and they are content of policy and context of policy. The expected outcome(s) that comes out from implementation of the activities is taxpayers' compliance. Nurmantu (2009) defines tax compliance as a condition when taxpayers fulfill their obligations and exercise their taxation rights.

Since tax socialization instills an understanding and provides knowledge, it is considered a form of tax education. Bahari and Ling (2009) state that tax education might have influenced people's attitudes towards taxation and tax compliance behaviors. Mohdali (2012) states that the main factor that influences taxpayers' compliance is not the economic factor. The psychological approach to fiscal also states that tax education should not only focus on the behaviors of taxpayers and the influence of a group, but also the influence of government actions and the effect of tax authority's response towards taxpayers' behaviors.

According to Schmolders (1970), as cited by Mohdali (2012), there are three elements shaping the behaviors of taxpayers: First is the tax mentality which includes taxpayers who hesitate to violate the law. This behavior is influenced by the social environment and personal experience. Second is the tax tension feeling which is the unequal distribution of tax load among taxpayers which creates dissatisfaction to current taxation system. The opinions of taxpayers to fairness and unfairness of the taxation system can also be identified as the influential factor in tax compliance behaviors. Third is the tax morale which is defined as the internal individual motivation that may derive from the religious belief or the moral values to pay taxes and intrinsic motivations. According to Graetz and Wilde as cited in Mohdali (2012), the tax morale can be described as the commitment to the responsibilities of citizenship and respect for the law.

Tax socialization program in high schools or equivalent places teachers as agents of tax socialization and agents of change. Agents of socialization are the parties which conduct socialization (Devano, 2006) while agents of change are individuals whose duty are to influence targets of change to make decisions according to the desired direction (Anwar, 2013). The agents of changes connect the source of change which can be in the form of innovation or policy with the community as the target of change. Tax socialization program attempts to enhance voluntary tax compliance in community. Kirchler and Wahl as cited by Mohdali (2012) state that voluntary tax compliance is originated from spontaneous willingness to cooperate, emanating from taxpayer's moral obligation to contribute to the public welfare.

RESEARCH METHODOLOGY

This study used qualitative approach to gain an understanding of implementation of tax socialization for teachers in high schools in Regional Office of West Java II DGT. This study can be classified as a descriptive study. Based on its significance, this study was pure research since its aim was only for academic purposes. Based on the duration, this study was cross-sectional since it was conducted between Marchs until June 2014 and could not be compared to other studies. Based on the data collection technique, the study used a field study and a desk study. Primary data were collected from in-depth interviews and secondary data were taken from the desk study to support the primary data obtained from field study.

RESULTS AND DISCUSSION

Tax socialization program for teachers in high schools was implemented based on the Letter of the Counselling, Service, and Public Relation Director Number S-641/PJ.09/2013 dated 29 April 2013 on the Implementation Guideline of Tax Socialization for Teachers. The next part of this paper discusses the basis for tax socialization program for teachers in high schools, the implementation of tax socialization for teachers in Regional Office of West Java II Directorate General of Taxation (DGT), and the roles of tax socialization for teachers seen from the elements shaping behaviors of taxpayer behaviors.

Considerations for Tax Socialization Program Implementation for the Teachers in High Schools

There are a few factors that become consideration for implementation of tax socialization program for teachers in high schools. First is limitation in the number of DGT employees. The number of students in high schools or equivalent education in Indonesia exceeds the number of DGT employees. According to I Putu Sudiana from the Directorate of Counselling, Service, and Public Relation in DGT, the number of employees in the tax offices in 2014 was 32,000 employees and only around 5,000 until 6,000 were in charge of conducting socialization. Meanwhile, based on the Gross/Net Enrollment Rate in early childhood, elementary, middle and high schools, and also higher education (including Islamic Religious Schools and equivalent) in 2012/2013, the number of students in high schools in Indonesia in 2013 was 9,828,067 students. The employees in tax offices will not be enough to conduct socialization program for the entire high school students. The number of teachers in high schools and equivalent, however, is 440,168 teachers according to the Summary of the Indonesia's Education Statistics in 2011/2012. This number is significantly larger than the 5,000 - 6,000 tax office employees who are in charge of the tax socialization program.

Second, the communities consider teachers as respected figures who are trusted and must be followed. I Putu Sudiana states that until now, the communities still believe that teachers are role models that can be trusted and they deserve to be modeled and followed. The community's trust towards the teachers prompts DGT to provide socialization for the teachers in high schools and equivalent.

Third, an awareness on the importance of taxation needs to be instilled in students' mind. Awareness on the importance of taxation needs to be introduced early on since it is related to the effort of shaping people's behaviors. As explained by Dwi Astuti, the Head of Counselling, Service, and Public Relation of the Regional Office of West Java II DGT, the process of promoting tax awareness to the students in high schools will be a long-term investment.

Last consideration for the program is related to DGT's effort to include taxation materials in the School Curriculum. The socialization program for teachers aims at increasing taxation knowledge for teachers and at the same time providing preliminary information which is related to DGT's effort to include taxation materials in the School Curriculum. Even though this effort to include the taxation materials in the curriculum has not shown any positive result, efforts to provide the knowledge, an understanding, and an awareness for the students through the teachers can still be carried out.

Based on the Letter of the Counselling, Service, and Public Relation Director Number S-641/PJ.09/2013 on the Implementation Guideline of Tax Socialization for Teachers, the program will mainly target teachers for high schools and equivalent level. There are two reasons why high school teachers were selected as target of tax socialization program. First, a limitation needs to be made in relation to the evaluation of the program implemented. Second, the implementation of the socialization program has a time and funding limitation. This time and funding limitation needs to be put into account due to the large number of teachers from the elementary to the high school level in Indonesia. The following Table shows the number of teachers based on their level and status in Indonesia in 2011/2012.

Table 1. The Number of Teachers in Indonesia in 2011/2012

No	Level	Employment Status		
		Civil Servants	Non-civil servant	Total
1	Elementary schools and equivalent	1,074,701	475,575	1,550,276
2	Middle schools and equivalent	358,528	155,303	513,831
3	High schools and equivalent	240,519	199,649	440,168

Source: Taken from the Ministry of Education and Culture, A Summary of Education Statistics in Indonesia in 2011/2012.

It can be seen in Table 1 that while the number of elementary school teachers in Indonesia in 2011/2012 was 1,550,276 teachers and the number of middle school teachers was 513,831 teachers, the number of high school teachers in Indonesia was 440,168 teachers. If the teachers from all three levels are put together, the total is 2,504,275 teachers. With this kind of number, a large sum of money and a long period of time is needed to conduct the tax socialization for all teachers in all levels in Indonesia.

Second, the reason why high schools were selected was because the students in this age group is mature enough and ready for either the next level of education which is the higher education or work. This is in line with the strategy of DGT that states that more mature people are readier to accept and comply.

Implementation of Tax Socialization for Teachers in High Schools or Equivalent in the Regional Office of West Java II Directorate General Taxation

The implementation of the tax socialization program conducted by the DGT, which is the tax socialization for the teachers of high schools, is influenced by two factors: content of policy and context of policy. Next paragraph explains more about the content of policy and the context of policy which influence implementation of tax socialization program for teachers in high schools in Regional Office of West Java II DGT.

CONTENT OF POLICY

Content of policy is a factor that influences implementation of activities which according to Grindle includes 6 factors: influenced interest, type of benefits, desired degree of changes, decision-making position, implementation of the program, and resources involved. **The Influenced Interest**

Tax socialization program for teachers in high schools implemented by the Regional Office of West Java II DGT as form of implementation of tax policy indeed has an interest. According to Irfitriyan Mahry, the Officer in the Pratama Bogor Tax Office, the only program's interest is to facilitate in-depth knowledge and understanding on taxation. The program's sole interest is to instill knowledge and understanding on taxation to the students through teachers so that students would understand. It is hoped that the program may help students develop a sense of responsibility towards taxation and enhance voluntary tax compliance.

Types of Benefits

There are benefits of tax socialization program for teachers in high schools implemented by Regional Office of West Java II DGT and these benefits can be felt in the wake of implementation activities. The program is a form of investment whose benefits can be felt in the next few years. The program should be given early on to prospective taxpayers. Even when objective of the program is to increase voluntary tax compliance of prospective taxpayers, the program has concrete benefits which can be felt directly by participants of the program, i.e. teachers.

Desired Degree of Changes

Tax socialization program has short-term and long-term objectives. The short-term objective is to promote an awareness from teachers as taxpayers themselves, while the long-term benefit is to promote teachers as agents of change by providing knowledge on taxation to their students. It is hoped that the program may increase a sense of responsibility from students towards taxation and it may change students' behaviors accordingly.

Decision-Making Position

According to Grindle, position or location of implementation of a policy can be geographical or organizational. Geographically, tax socialization program is held nationally and organizationally, the program is implemented by Regional Office of DGT across Indonesia. Based on Letter of the Director General of Taxation Number SE-98/PJ/2011, a national socialization program is implemented by all work units with a theme set by DGT Headquarter which in this case was the Central Office of Counselling, Service, and Public Relation. The procedure of implementation is regulated in Letter of Counselling, Service, and Public Relation Director Number S-641/PJ.09/2013, as a follow-up of Letter of Counselling, Service, and Public Relation Director Number S-30/PJ.09/2013 on Theme of Taxation Counselling Activities in 2013.

Program Implementation

The focus and main target of program is, in fact, students as prospective taxpayers. Based on Letter of Director General of Taxation Number SE-05/PJ/2013 on Procedures of Taxation Counselling Implementation, tasks and responsibilities of Regional Office of DGT are to conduct a socialization program by focusing on prospective taxpayers. Grindle explains that a person who is responsible for implementation of a program should be a person who is active, skillful, and more personally dedicated to the program compared to others.

Tax socialization program for teachers in high schools and equivalent implemented by Regional Office of West Java II DGT is carried out by the exact people described by Grindle. Dwi Astuti, one of implementers, was really passionate to the program since she realized the importance of early tax education for students as a long-term investment whose benefits will be felt in the coming years.

Resources Involved

Implementation of the program requires various adequate resources such as humans, funds, facilities, and infrastructures for the program to be implemented successfully. Tax socialization program requires human resources such as facilitators and participants. Participants of the program were teachers from all subjects such as Social Study, Citizenship, Economics, and Accounting while facilitators were employees of DGT and local tax offices. The facility used in the program was local tax office as the place of socialization activities. Another resource used was the funding. Funding Budget is proposed every year by the Regional Office of DGT to the Headquarter for approval.

CONTEXT OF POLICY

The implementation of the tax socialization program conducted by the DGT, which is the tax socialization for the teachers of high schools is also influenced by the context of policy among which are the power, interest, and the strategies of the actors involved, characteristics of institutions and power, and the compliance and responsiveness.

Power, Interest, and the Strategies Made by the Actors Involved

Grindle states that each actor involved in a program has power, interest, and different strategies. Actors in the implementation of the tax socialization program for teachers have the power and authority to do so. The authority on the policy which constitutes 5M (Man, Money, Machine, Method, Material) is present in the hand of the Directorate of Counselling, Service, and Public Relation of the Central DGT. The tasks and the function of the Regional Office of DGT in this case is the Counselling, Service, and Public Relation Section of the Regional Office of DGT are as the executor of the tax socialization program. The Regional Tax Offices (KPP) of West Java II DGT which have the authority to conduct the tax socialization program for teachers in high schools in their service areas are KPP Pratama Cileungsi, KPP Pratama Karawang Utara, and KPP Pratama Bogor.

DGT as the actor with the interest to this program, which is maximum revenue from tax, provides tax socialization program for new taxpayers and registered taxpayers compared to prospective taxpayers. However, since the main tasks of DGT are to collect state revenue from tax and to achieve a very high target, potential taxpayers becomes the priority for the program.

The interest to collect revenue from tax which causes DGT to prioritize socialization program to new and registered taxpayers is reasonable. The current condition shows that tax is main income for the state since more than 70% of state revenue is from tax. Based on main data of the State Budget in the Financial Note and the State Budget Draft for 2014 Budget Year, revenue from tax in 2013 wofficersas Rp1,148 trillion while the total of state revenue was Rp1,502 trillion. This shows that 76.45% of state income was from tax.

Implementation of tax socialization program for teachers in high schools requires a careful strategy so that the program can be carried out successfully. One of the strategies in implementation was by including the taxation materials in school curriculum. This strategy may guarantee the continuity of tax socialization program for teachers. Another strategy carried out by Regional Office of West Java II DGT to guarantee success of the program was to form a counselling team and conduct other supporting strategies.

Characteristics of Institutions and Power

Characteristic of DGT is an institution that is focused on the revenue derived from tax. This is embedded in characteristics of DGT working units and tax officers that the collection of revenue from tax becomes priority. Tax socialization program becomes second priority next to the collection of revenue from tax. These characteristics affect implementation of tax socialization program for teachers in high schools whose real targets are the students as prospective taxpayers. This program is not done in a mass scale across Indonesia since many Regional Offices of DGT are not ready to implement it.

Compliance and Responsiveness

Grindle states that for a program to be successful, it requires supports, compliance and responsiveness of the agents of implementation. The Regional Office of DGT as executor of tax socialization program for teachers has compliance and good responsiveness to implementation of the program which heavily relies on responsiveness and passion of head of Counselling, Service, and Public Relation Section in local regional offices.

Changes in Teachers and Teachers' Acceptance of Tax Socialization Program

Changes felt by the teachers after attending the program were expansion of knowledge and understanding of taxation. These changes are expected to cause changes consecutively in students since knowledge and understanding gained during the program is passed on to students. It is hoped that the students' attitude towards taxation will change after understanding importance of taxation, function, and benefits of taxes.

At the beginning, teachers were not too enthusiastic about tax socialization program. They were wondering why the program needed to be carried out. However, after attending the program, teachers welcome it and wished that the program could be held more often in schools.

Challenges in Implementation of Tax Socialization

There were challenges of implementation of tax socialization program for teachers in Regional Office of West Java II DGT. First, it was difficult to convince Education Office and Ministry of Education and Culture the importance of tax socialization program for teachers and to convince them that the program needed to be implemented. The second challenge is that teachers had different teaching schedules and these different schedules needed to be matched with the days of the program. The third is difficulty in encouraging teachers to become participants of the program. The fourth is participants of the program were often unfocused during activities. The last is that there was limitation to time for the program and therefore, only a small number of materials were brought to the program.

Tax Socialization for Teacher Seen from the Elements Shaping Taxpayer's Behaviors

Tax socialization for teachers in high schools implemented by the Regional Office of West Java II DGT provides an understanding of taxation to teachers as effort to form behavior of taxpayers. According to Schmolders (1970), as cited by Mohdali (2012), there are three elements shaping behaviors of taxpayers. Tax mentality describes taxpayers who hesitate to violate the law. The mentality to comply with obligation to pay tax is influenced by social environment and personal experience. Tax tension feeling is opinions of taxpayers to taxation system. The unequal distribution of tax load among taxpayers may create dissatisfaction to current taxation system. Tax morale is defined as internal individual motivation that may derive from religious belief or moral values and intrinsic motivations to pay taxes. According to Graetz and Wilde (1985, p.385) as cited in Mohdali (2012), tax morale is described as commitment to responsibilities of citizenship and respect for law.

Tax socialization program for students is also an effort to shape behaviors of taxpayers early on. With tax socialization program given to teachers as agents of socialization and agents of change, it is hoped that program may shape tax mentality, tax tension feeling, and tax morale of prospective taxpayers. Tax is responsibility of the citizens, which in this case are taxpayers, to the state. Promoting awareness of their responsibility may help strengthen commitment of citizens to respect and obey the law. Tax socialization program for teachers is an effort to promote sense of responsibility on part of teachers to pass message to students on their responsibility to the state in term of taxation. Continuous implementation of tax socialization program may form the tax mentality, tax tension feeling, and tax morale of students which in turn, form the voluntary tax compliance.

Tax Education to Students through Tax Socialization to Teachers

Tax education provides knowledge and understanding to students of high schools as prospective taxpayers who in the future will become the taxpayers themselves. It is important to implement tax education due to its role in dynamic development of taxation. The regulations and taxation system are always changing following national and global economic development.

Students in high schools as prospective taxpayers need to be equipped with an understanding and knowledge in taxation early on and continuously since so that when they have become taxpayers, they have a better understanding on taxation regulations and thus, obey them. In turn, they are expected to have the voluntary tax compliance. Tax socialization program for teachers implemented by DGT is an effort to provide tax education for students through their teachers as agents of learning.

Teachers as Agents of Tax Socialization

Taxation is new knowledge which a person cannot get from his family and friends. The teachers are the party who is charge of imparting knowledge and understanding of taxation to students. Irfitriyan Mahry explains that the effort to instill knowledge and understanding of taxation turns teachers into agents of tax socialization. Teachers may become DGT's partners to disseminate taxation materials to students since teachers are the one who directly face students. DGT needs to work in partnership with various parties with the capacity to convey knowledge on and provide an understanding of taxation. Teachers are seen to have capacity to become agents of tax socialization and to carry duty to instill values of taxation to students and community.

Teachers as Agents of Change

Implementation of tax socialization program for teachers in high schools turns teachers as the agents of change. Teachers become communication channel for DGT to disseminate knowledge on taxation to students. By becoming the agents of change, teachers are expected to help DGT share and instill knowledge on taxation to students and to community. A program cannot be implemented without presence of agents of changes as connectors who communicate program to targeted parties.

Tax Socialization Program for Teachers as an Effort to Enhance Voluntary Tax Compliance to Students

By instilling knowledge and understanding of taxation to students as prospective taxpayers, it is hoped that students develop an awareness of their responsibility towards taxation. When students become mature and become taxpayers themselves, it is hoped that they carry out their obligation to pay tax. Educating the prospective taxpayers correctly will enhance voluntary tax compliance in the future.

CONCLUSION

1. The reasons for implementation of tax socialization for teachers in high schools among which are limited number of DGT employees, the view that teachers are respected figures and role models, the desire to promote an awareness of responsibility towards taxation, and effort to include taxation materials in 2013 school curriculum. The reasons why teachers were chosen to be targets of tax socialization program was limitation of survey for DGT evaluation, limitation of time and funding, and the fact that students in high schools are in the right age to understand importance of taxation. The program is expected to provide teachers with good knowledge and understanding of taxation which they then pass to their students with the hope that students have an awareness of their responsibility towards taxation and in turn, enhance voluntary tax compliance.
2. Implementation of tax socialization program conducted by the DGT, which is tax socialization for teachers of high schools and equivalent, is influenced by two factors: content of policy and context of policy. Changes did happen to teachers and there was positive acceptance from teachers. Some of challenges experienced by the program were convincing Education Office and Ministry of Education and Culture the importance of tax socialization program for teachers, matching teachers' schedules, encouraging teachers to attend the program, having unfocused teachers and having limited implementation time.
3. Tax socialization program for teachers in high schools implemented by the Regional Office of West Java II DGT attempted to promote teachers' commitment to take responsibility as taxpayers and as teachers to promote an awareness of responsibility towards taxation to students. Tax socialization program is hoped to give tax education to students through teachers. This allows teachers to become agents of tax socialization and agents of change. It is hoped that teachers are able to instill knowledge and understanding of taxation to students as the prospective taxpayers in order to promote an awareness of their responsibility towards taxation. It is also hoped that when students become taxpayers, they will develop voluntary tax compliance.

REFERENCES

- Anwar, Syaiful dan Utama, Widayaiswara. (2013). *Agen Perubahan (Agent of Change)*. Diakses pada 18 April, 2014 dari http://www.bppk.depkeu.go.id/webbbc/index.php?option=com_docman&task=doc_download&gid=606&Itemid=.
- Bahari Anis Barieyah Mat and Ling Lai Ming. (2009). Introducing Tax Education in Non-Accounting Curriculum in Higher Education: Survey Evidence." *Journal of Financial Reporting and Accounting*, ISSN 1985-2517, Vol. 7, Iss. 1, 37-51.
- Devano, Sony dan Rahayu, Siti Kurnia. (2006). *Perpajakan: Konsep, Teori, dan Isu*. Jakarta: Kencana Prenada Media Group.
- Grindle, Merilee S. (1980). *Politics and Policy Implementation in the Third World*. New Jersey : Princeton University Press.
- Hofmann Eva, Hoelzl Erich and Kirchler Erich. (2008). Preconditions of Voluntary Tax Compliance: Knowledge and Evaluation of Taxation, Norms, Fairness, and Motivation to Cooperate. *Faculty of Psychology, University of Vienna, Austria, Europe PMC Funders Group Author Manuscript Z Psychol. Author manuscript; available in PMC 2012 March 14. Published in final edited form as: Z Psychol 216:4, 209-217.*

- Kementerian Keuangan Republik Indonesia, Direktorat Jenderal Pajak, Kantor Wilayah Direktorat Jenderal Pajak Jawa Barat II. (2012). *Laporan Tahunan 2012 Sinergi Membangun Negeri*, Jakarta.
- Manurung, Surya. (2013). Kompleksitas Kepatuhan Wajib Pajak. Diakses pada 11 Desember, 2013 dari <http://www.pajak.go.id/content/article/kompleksitas-kepatuhan-pajak> Oleh Pegawai Direktorat Jenderal Pajak.
- Mohdali, Raihana and Pope, Jeff. (2012). The effects of religiosity and external environment on voluntary tax compliance. *New Zealand Journal of Taxation Law and Policy* 18, 119-139.
- Nugroho, Riant. (2004). *Kebijakan Publik: Formulasi, Implementasi, dan Evaluasi*. Jakarta: PT Gramedia.
- Nurmantu, Safri. (2005). *Pengantar Perpajakan*. Jakarta: Granit.
- Simanjuntak, Timbul Hamongan dan Imam Mukhlis. (2012). *Dimensi Ekonomi Perpajakan Dalam Pembangunan Ekonomi*. Depok: Raih Asa Sukses.
- Sunarto, Kamanto. (2004). *Pengantar Sosiologi*. Jakarta: Lembaga Penerbit Fakultas Ekonomi Universitas Indonesia.
- Winartati, Anita Setia and Milla Sepliana Setyowati, Implementation of Tax Education on Elementary School Students as an Effort to Raise Tax Awareness in Directorate General of Taxes Regional Office for West Java II, *Turkish Online Journal of Education Technology*, November 2016.

Teachers' Use of Information and Communications Technology in Education: Cameroon Secondary Schools Perspectives

Shaibou Abdoulai HAJI

Korea University

haji@korea.ac.kr

Gracemary Elohekeke MOLUAYONGE

Korea University

graciacallisse@yahoo.com

Innwoo PARK

Korea University

parki@korea.ac.kr

ABSTRACT

Information and Communications Technology (ICT) offers innovative tools for restructuring teaching and learning processes in preparing students for the 21st Century skills. However, there is no sufficient and reliable data concerning how the use of ICT fit in different school cultures in Cameroon, and how teachers with varying pedagogical and domain expertise and learning experiences are able to function with various network learning environments. This paper discusses teachers Use of ICT in Education on the basis of intensive case studies conducted in Cameroon secondary schools. A total of 320 teachers from 16 public, denominational and lay private schools from two regions in Cameroon participated in this study. The survey was used for data collection. Descriptive statistics and independent sample t-tests and ANOVA were used to analyze the data. The results of this study indicate teachers' perceived ICT usage, perceived access to ICT, perceived ICT competence and perceived ICT training support were low. Furthermore, the analysis showed that teachers in an urban area perceived the use of ICT and perceived access to ICT was higher than teachers in the rural area. Finally, this study discovered that there was no significant difference in public, private and denominational school teachers' use of ICT, access to ICT, competencies and training support. The results provide insights into factors that teachers perceived as obstacles to the use of ICT in their teaching, particularly in developing nations.

Keywords: Information and communications technology (ICT), ICT competence, training support

INTRODUCTION

Information and communication technology (ICT) plays a crucial role in the knowledge and information society by increasing economic productivity through digital economies, enhancing the delivery of public and private services and achieving broad socioeconomic goals in education, health care, employment and social development (UNESCO-UIS, 2015). ICT in education can help individuals to compete and adapt to the knowledge and information society by achieving the 21st-century skills which can enhance skilled workforce and social mobility. ICT in education has a multiplier effect throughout the school system, by; enhancing learning and providing students with new sets of skills (Balanksat et al., 2006); reaching students with poor or no access (Young, 2002; UNESCO-UIS, 2015.); facilitating and improving the training of teachers (KERIS, 2011); increasing the possibilities of communication and reinforcement of the development of skills of coordination and collaboration between peers (Dede, 2009); and minimizing costs associated with the delivery of traditional instruction (Gulati, 2008; KERIS, 2012). Research studies have also found that positive perceptions of teachers on ICT integration into schools and ICT usage in their teaching are essential to successful implementation of ICT in education (Almekhlafi and Almeqdadi, 2010; Aydin, 2013; Sipilä, 2014; Choy and Ng, 2015). Teachers' attitudes towards the use of ICT impact on their ICT integration in the classroom, decisions they make and actions they take in classrooms (Shaibou, 2015).

Teachers' use of ICT in Cameroon has been less than optimal, and in spite of its potential educational benefits of ICT in Education, teachers may not have benefits, for various reasons (for example lack of training, resistance to change, among others). Perhaps this is because of the lack of focus on ICT in Cameroon. For example, in 1995, when the National Forum on Education took place in the country's capital, Yaoundé, from the 22nd to the 27th of May nothing was said about the use of ICT in schools. However, the Law of Orientation of Basic and Secondary Education (Law No. 98/004 of April 14, 1998) which is mostly based on the recommendations of the National Education acknowledges in general terms the potential contributions of ICT in education. It states in Section 25 (Part III) that "the education provided in schools shall take into account scientific and technological advancement and shall be tailored in terms of content and method, to national and international economic, scientific, technological, social and cultural trends." ICTs were officially introduced into the Cameroon secondary education system in February 2001 by the president in his message to the youth, in which he called on them to embrace the knowledge economy (Mbangwana, 2008). As a consequence, computers were introduced into many General Secondary schools, and secondary technical/vocational schools and many schools benefitted from presidential grants of multi media centers connected to the internet.

This initiative has started to address the many problems that plague secondary education in Cameroon, among them acute shortages of basic pedagogic material and human resource inputs, overcrowded classrooms, problems of relevance, and quality, and inadequate access, among others. The use of ICT has the potential to address some of these problems. For example, ICT can improve access to education, equity and the quality of teachers' professional development (Robinson, 2008; Mervyn, 2002). With all these initiatives in place, there is no clear, recognizable national strategic plan for the integration of modern technology within the school curricula and pedagogical activities. The use of ICT in Cameroon secondary schools mostly depends more on the school leadership and dynamism and enthusiasm of teachers.

Many Secondary Schools have adopted ICT policies and are in the process of implementation. Although significant educational research has been carried out in other countries on the use of ICT in schools, the results were mostly context-specific due to population, sampling, and/or design limitations. In other words, the findings cannot be applied to Cameroon because of contextual differences. Apart from the contextual factors, findings may not apply because of potential differences among participants. That is, Cameroonian teachers have differing experiences with modern technology due to the recent presence of modern technology in their schools and their distinct cultural background (Shaibou, 2015). However, there is no study on ICT integration by teachers in Cameroon secondary schools. Hence, it is important to investigate teachers' perceptions of ICT access, ICT training, ICT competencies, leadership support, and ICT integration. Research findings from teachers' perceptions and ICT usage may have important implications for administrators, departments, students, and employers and may enhance educational delivery to students' learning experience in secondary school, and students' application of knowledge and skills in the real world of work. Therefore, we reason that it is necessary to investigate teachers' perceptions and ICT usage in education.

Purpose

The purpose of this paper is to investigate Teachers Use of ICTs in Cameroon Secondary Schools.

Research questions 1. What are teachers' levels of ICT use in secondary schools?

2. What are teachers' perceived ICT access, competence, training and ICT support?

3. Are there differences in perceptions of teachers' ICT use, access, competence, and support with regards to school location (Urban and Rural)?

4. Are there differences in perceptions of teachers' ICT use, access, competence, and ICT support with regards to school type (Public, Denominational, and Lay Private)?

THE STUDY

ICT is considered as a tool to transform teaching and learning the process, improve students' learning, to supplement the curriculum and the develop pedagogy (KERIS, 2005, Malaysian Ministry of Education, 2006). The integration of ICT in teaching and learning depend very much on the teachers' initiatives. The main objective of using ICT in the school is to make the teaching and learning process more effective, efficient and appealing. However, to achieve this, the teachers themselves have to be well prepared and competent in ICT. They have to be ready in terms of ICT competencies to face their students who are mostly 'Digital Natives' and are generally comfortable using ICT devices.

Nowadays many different types of technology are used to support and enhance the teaching and learning process. This includes everything from surfing the internet to collecting information for lessons preparation and using applications to prepare presentations, creating digital learning materials for students. Also, using ICT to provide feedback, assess students' learning, communicating online with parents, download and upload material from the school's portals or learning management system to looking for online professional development opportunities.

In this study, 16 public, private and denominational secondary schools were randomly selected. The schools comprised three public Secondary Schools, three private Secondary schools and two denominational in each region. The categorization of the schools was urban schools and rural schools. The participants were randomly selected. A total of 302 questionnaire were received, representing 94.38 percent return rate from 320 questionnaire distributed to teachers. Of these, 12 questionnaire were deemed unusable, due to data incompleteness, and were subsequently dropped from the data set leaving 290 questionnaire for data screening. Of these, 8 questionnaire were detected as outliers and deleted from the data set leaving 282 cases for the data analysis. The questionnaire consisted of 53 items and was categorized into three sections. Section A consists of seven demographic items, section B consists of ten items of teachers' ICT usage, and section C contains nine items of perceived access to ICT, twelve items of competency, ten items on training and five items of on types of support training that were related to teachers' use of ICT. A reliability test was carried out to determine the internal consistency of items in the questionnaire using Cronbach's α reliability test. Cronbach's α coefficient for the pilot questionnaire was 0.80, and the final questionnaire used for the study was 0.84. According to Kline (2016), α -value of 0.90 is considered excellent, 0.80 very good and 0.70 acceptable.

FINDINGS

Of 282 respondents, 56.6% were males, and 43.4% were females. The age of the teachers ranged from 20 to over 50 years. 29.3% were between 20 and 29 years old; 39.1% were between 30 and 39 years old; 16.0% were between 40 and 49 years old; 15.6% were over 50 years old; 50.4% of the teachers taught in public schools; 25.2% taught in denominational schools, and 24.5% taught inlay private schools. In total 57.4% of the teachers came from urban and 42.6% from rural schools. In terms of academic qualification, 30.1% had DIPES I, 35.5% had bachelor's degree, 19.5% had DIPES II, and 4.6% had other qualifications. In addition, 35.5% had more than no ICT training experience, 42.6% had had basic ICT training experience, 14.9%t had intermediate level ICT training and 7.1% had other ICT training experience.

What are teachers' levels of ICT use in secondary schools?

In analyzing Table, I, the mean values greater than 3.0 is considered high ICT integration in teaching, while mean values less than 3.0 is considered low integration.

Table 1: Percentage, mean and standard deviation of perceived teachers ICT use

Item	Mean	Std. Deviation
Surf the internet to collect information to prepare lessons	2.79	.4434
Browse the internet to collect learning material or resources to be used by students during lessons	2.58	.5084
Use applications to prepare presentations for lessons	2.15	.5236
Create your own digital learning materials for students	1.67	.7371
Prepare exercises and tasks for students	2.26	.4701
Post homework for students on the school website	1.66	.7387
Use ICT to provide feedback and/or assess students' learning	1.66	.7387
Communicate online with parents	2.15	.4004
Download/upload/browse material from the school's website or virtual learning environment / learning platform	2.65	.5354
Look for online professional development opportunities	2.80	.4443
Overall ICT Use	2.24	.3298

Note: Cronbach's $\alpha=0.78$

The table above shows that teachers' use of ICT in teaching and learning process is low ($m=2.24$, $SD=.33$). Among the 10 items that were designed to measure teachers' use of ICT, none of the elements has a mean of 3 which is the cutoff mean. This shows that ICT integration in Cameroon secondary schools is low partly due to poor or no proper ICT infrastructure.

Teachers' perceived ICT access

In analyzing Table, 2, the mean values greater than 2 is considered good access to ICT in teaching, while mean values less than 2 is considered low Access to ICT.

Table 2: Percentage, mean and standard deviation of perceived Teachers' perceived ICT access

Item	% No Access	Access on demand	Permanent Access	Mean	Std. Deviation
Desktop computer without internet access	20.9	57.4	21.6	2.01	.6535
Desktop computer with internet access	20.9	56.4	22.7	2.02	.6614
Non-internet-connected laptop, tablet PC, netbook or mini	21.3	60.6	18.1	2.00	.6277
Internet-connected laptop, tablet PC, netbook or mini	42.6	57.4	0	1.58	.4953
Photocopier	57.4	42.6	0	1.58	.4953
Have a Smartphone	0	0	100.0	3.00	.0000
Projector	45.0	55.0	0	1.55	.4984
Digital camera or camcorder	37.9	62.1	0	1.62	.4861
Computer laboratory	21.3	58.2	20.6	2.00	.6480
Overall Access				1.92	.4045

Cronbach's Alpha= .91

Table 2 shows that the overall teachers' perceived ICT access is low ($M=1.92$, $SD=.41$). However, teachers have good access to; desktop computer without internet access ($M=2.01$, $SD=.65$), desktop computer with internet access ($M=2.02$, $SD=.66$), Non-internet-connected laptop, tablet PC, netbook or mini ($M=2.00$, $SD=.63$), and Computer laboratory ($M=2.00$, $SD=.65$). Even though all the teachers have smartphone ($M=3$, $SD=.00$) but only very few of them use it in their teaching and learning process as teachers' use of ICT in teaching and learning process is low ($m=2.24$, $SD=.33$)

ICT competency

In analyzing Table, 3, the mean values greater than 3.0 is considered high ICT competency, while mean values less than 3.0 is considered low ICT competency.

Table 3: Percentage, mean and standard deviation of perceived ICT Competencies

ICT Competence Item	%				Mean	Std. Deviation
	Very much Competent	Moderate Competent	Little Competent	No Competent		
Produce a text using a word processing program	2.5	70.6	2.5	5.3	2.70	.6054
Use emails to communicate with others	2.1	53.2	37.2	7.4	2.50	.6656
Capture and edit digital photos, movies or other graphics	2.8	40.8	49.3	7.1	2.40	.6624
Edit text online containing internet links and images	0.7	42.2	52.8	5.3	2.37	.5963
Create a database	2.5	45.4	40.8	11.3	2.39	.7186
Organize computer files in folders and subfolders	2.5	62.4	29.8	5.3	2.62	.6268
Use a spread sheet	2.1	62.1	31.6	4.3	2.62	.6037
Create a presentation with simple animation functions	2.5	53.9	37.2	6.4	2.53	.6544
Create a presentation with video or audio clips	2.1	57.8	31.9	8.2	2.54	.6751
Participate in a discussion forum on the internet	0.7	61.0	32.6	5.7	2.57	.6119
Create and maintain blogs or web sites	1.8	28.7	53.2	16.3	2.16	.7054
Participate in social networks	2.5	56.0	34.4	7.1	2.54	.6645
Overall Competence					2.49	.4950
Cronbach's Alpha=.93						

Table 3 shows that teachers' ICT Competence is low ($M=2.49$, $SD=.50$). Among the 12 items that were designed to measure teachers' ICT Competence, none of the elements has a mean of 3 which is the cutoff mean. This shows that teachers need to be trained on the use and integration of ICT in their classrooms. Teachers' ICT Competence is low partly due to little or no support ($M=1.95$, $SD=.53$)

To what extent do you agree with the following professional development opportunities provided by the school in the past one school year?

In analyzing Table, 4, the mean values greater than 3.0 is considered high ICT support, while mean values less than 3.0 is considered low ICT support. 10 items were designed to measure ICT support type provided by the school in the last one year. Table 4 shows that teacher received very low support ($M=1.95$, $SD=.53$) in integrating ICT in their teaching and learning process. Only Personal learning about ICT in own time ($M= 2.80$, $SD= .44$) and receiving other professional development opportunities related to ICT ($M= 2.64$, $SD=1.26$) have average means showing that teachers in Cameroon secondary schools try to learn and use ICT on their own.

Table 4: Percentage, mean and standard deviation of perceived ICT training

ICT Training Support item	%				Mean	Std. Deviation
	SA	A	D	SD		
Introductory courses on internet use and general applications (basic Word processing, spread sheets, presentations, databases, etc.)	0	14.2	46.8	39.0	1.75	.6870
Advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment etc.)	1.4	12.4	39.7	46.5	1.69	.7416
Advanced courses on internet use (creating websites/home page, video conferencing, etc.)	1.4	14.5	41.1	42.9	1.75	.7537
Equipment-specific training (interactive whiteboard, laptop, etc.)	0.7	10.6	47.2	41.5	1.71	.6817
Courses on the pedagogical use of ICT in teaching and learning	1.1	14.5	54.3	30.1	1.87	.6877
Subject-specific training on learning applications (tutorials, simulations, etc.)	0.0	13.8	51.8	34.4	1.79	.6645
Participate in online communities (e.g. mailing lists, twitter, blogs) for professional discussions with other teachers	0.7	12.8	45.0	41.5	1.73	.7058
ICT training provided by school staff	1.1	13.8	42.9	42.2	1.74	.7320
Personal learning about ICT in your own time	1.4	77.3	20.9	0.4	2.80	.4443
Other professional development opportunities related to ICT	0.4	57.4	41.8	0.4	2.64	1.2610
Overall ICT Training					1.95	.5338
Cronbach's Alpha=.89						

ICT support type In Table 5, shows the percentage of perceived ICT support types received by the teachers.

Table 5: Percentage, perceived ICT support type received

ICT Support item	% Never Used	Mostly technical Support	Mostly Pedagogical Support	Both technical and pedagogical Support
A more experienced / knowledgeable teacher	34.4	36.2	25.9	3.5
School ICT/technology coordinator	20.9	37.2	24.5	17.4
Other school staff	25.9	35.5	33.3	5.3
Experts from outside the school	35.5	36.9	29.5	8.2
An online helpdesk, community or website	35.8	36.5	29.4	9.2
Cronbach's Alpha=.77				

The table above shows that teachers receive some types of ICT supports. However, the received support level is very low as only 17.4% of the teachers received both technical and pedagogical support from school ICT coordinator, 9.2% received from an online helpdesk, community or website.

Are there differences in perceptions of teachers' ICT use, access, competence, and training support with regards to school location (Urban and Rural)?

An independent-samples t-test was conducted to compare teachers' ICT use, access, competence, and training support in Urban and Rural schools.

Table 6: t and p values for teachers' ICT use, access, competence, and training support with regards to school location

Variables	Location	N	Mean	Std. Deviation	t-test	Sig. (2-tailed)
Overall ICT use	Rural	120	2.18	.34259	-2.27	.024
	Urban	162	2.27	.31564		.026
Overall Access	Rural	120	1.56	.33041	-19.88	.000
	Urban	162	2.19	.19427		.000
Overall Competence	Rural	120	2.54	.48011	1.33	.185
	Urban	162	2.46	.50448		.181
Overall Support	Rural	120	1.91	.53837	-1.00	.317
	Urban	162	1.97	.53033		.318

Note: p 0.05

There was significant difference in ICT use for teachers in Urban area ($M=2.27$, $SD=0.32$) and teachers in Rural area ($M=2.18$, $SD=0.34$); $t(280) = -2.27$, $p=0.024$. Based on Cohen's (1988) criteria of effect size, the magnitude of the differences in the means was very low ($\eta^2=0.018$). Also, there was significant difference in ICT access scores for teachers in Urban area ($M=2.19$, $SD=0.19$) and teachers in Rural area ($M=1.56$, $SD=0.33$); $t(280) = 19.88$, $p=0.00$. Based on the effect size, the magnitude of the differences in the means was large ($\eta^2=0.585$).

Furthermore, t-test conducted to compare teachers' ICT competence and support training scores for Urban and Rural schools. There was no significant difference in teachers' ICT use, competence, and training support for teachers in Urban and Rural schools as presented in Table 6.

Are there differences in perceptions of teachers' ICT use, access, competence, and ICT training support with regards to school type (Public, Denominational, and Lay Private)?

A one-way between subjects ANOVA was conducted to compare teachers' ICT use, access, competence, and ICT training support on Public, Denominational, and Lay Private schools

Table 7: F and p values for Research Question four

		Sum Squares	df	Mean Square	F	Sig.
Overall ICT use	Between Groups	.086	2	.043	.394	.675
	Within Groups	30.473	279	.109		
	Total	30.559	281			
Overall Access	Between Groups	.369	2	.184	1.128	.325
	Within Groups	45.604	279	.163		
	Total	45.973	281			
Overall Competence	Between Groups	.733	2	.366	1.501	.225
	Within Groups	68.105	279	.244		
	Total	68.837	281			
Overall Support	Between Groups	.748	2	.374	1.316	.270
	Within Groups	79.311	279	.284		
	Total	80.059	281			

Note: *p 0.05

There is no significant difference in teachers' ICT use (2, 279) $p=.68$, access (2, 279) $p=.33$, competence (2, 279) $p=.23$, and ICT training support (2, 279) $p=.27$ with regards to school type (Public, Denominational, and Lay Private).

CONCLUSIONS

The use of information and communication technologies in teaching and learning in Cameroon secondary schools has been clearly low due to: low confidence and low competencies of the teachers, formal opposition by teachers to use pedagogical tools that they were not initially trained to utilize in a professional way. Also, schools are unevenly equipped with ICT: in some schools, computers are concentrated in computer laboratories or school libraries, in others computers are only found in the staff rooms and administrative offices. Even though, there are no differences in teachers' ICT competence and support training scores for urban and rural schools; teachers in rural area have less opportunity in using ICT in their teaching compare to their colleague in the urban areas. This is partly due no electrical connectivity in the countryside. Low teachers' support: both pedagogical and technical other forms have dramatically led to low teachers' use of ICTs in the teaching and learning process.

REFERENCES

- Almekhlafi, A. G., & Almeqdadi, F. A. (2010). Teachers' Perceptions of Technology Integration in the United Arab Emirates School Classrooms. *Educational Technology & Society*, 13 (1), 165–175.
- Aydin, S. (2013). Teachers' perceptions about the use of computers in EFL teaching and learning: the case of Turkey. *Computer Assisted Language Learning*, 26(3), 214-233.
<http://dx.doi.org/10.1080/09588221.2012.654495>
- Balanskat, A., Blamire, R., & Kefala, S. (2006). *A review of studies of ICT impact on schools in Europe*: European School net.
- Choy, M. and Ng, Y. L. (2015). Mapping teachers' perceptions on technology use using the iTaCH implementation model: A case study of a Singapore school, 2: 1035527.
<http://dx.doi.org/10.1080/2331186X.2015.1035527>
- Dede, C. (2009). Technological supports for acquiring 21st-century skills. In E. Baker, B. McGraw, & P. Peterson (Eds.), *International Encyclopedia of Education*, 3rd Edition. Oxford, England: Elsevier.
- Gulati, S. (2008). Technology-Enhanced Learning in Developing Nations – a review. *International Review of Research in Open Distance Learning* 9-1 February
- Korea Education & Research Information Service. (2011). *White Paper on Adapting Education to the Information Age*, the Ministry of Education, Science & Technology and Korea Education Research Information Service.
- Korea Education & Research Information Service. (2012). *White Paper on Adapting Education to the Information Age*, the Ministry of Education, Science & Technology and Korea Education Research Information Service.
- Malaysian Ministry of Education (2006). *Education Development Blueprint 2006-2010*. Kuala Lumpur: Ministry of Education.
- Mbangwana, M.A. (2008). Introduction of ICT in Schools and Classroom. In K. Toure, T.M.S. Tchombe, & T. Karsenti (Eds.), *ICT and Changing Mindsets in Education*. Bamenda, Cameroon: Langaa; Bamako, Mali: ERNWACA ROCARE.
- Mervyn, F. (2002) How can ICT Help us to Improve Education? *Innovations in Education and Teaching International*, 39:4, 271-279, DOI: 10.1080/13558000210161061
- Robinson, B. (2008). Using distance education and ICT to improve access, equity, and the quality in rural teachers' professional development in western China, UNESCO Centre for Comparative Education Research University of Nottingham, UK.
- Shaibou A. Hi. (2015). Science Teachers' Attitudes towards the Use of Information and Communication Technology in Secondary Schools in Cameroon, *International Journal of Social Science and Humanities Research* ISSN 2348-3164 (online) Vol. 3, Issue 2, pp: (573-585).
- Sipilä, K. (2014). Educational use of information and communications technology: Teachers' perspective. *Technology, Pedagogy and Education*, 23, 225-241. <http://dx.doi.org/10.1080/1475939X.2013.813407>

- UNESCO-UIS, (2015). Information and Communication Technology (ICT) in Education in Sub-Saharan Africa: A comparative analysis of basic e-readiness in schools. Montreal: UNESCO Institute for Statistics.
- Young, J. (2002). The 24-hour professor. *The Chronicle of Higher Education*, Vol. 48, No. (38), Pg.; 31-33.

Technology and the Achievement Gap an Educator's Leadership Plan for Action with Training

Timothy J. BELLOFF SR

Arcadia University
bellofft@arcadia.edu

D. Bruce CAMPBELL JR

Arcadia University
campbellb@arcadia.edu

ABSTRACT

This paper explores how the achievement gap is affected by technology use in schools. In many studies, technology is hailed as the great equalizer when it comes to closing the gap. However there have been more recent studies that refute this claim even saying that improper use of technology in schools will increase the achievement gap. This paper examines potential plans for addressing the lack of training in using technology in the classroom. It shows how students, pre-service teachers, teachers, and administrators can be served by learning technology integration so that the technology can help in closing the achievement gap.

INTRODUCTION

Background Information

This paper will focus more on a concept of technology and the achievement gap and less on an actual school or institution that it affects. Technology has often been discussed as the great equalizer when it comes to education and specifically in educating our urban or minority students. Philip Lanoue, superintendent of Clarke County School District in Athens, Georgia, stated in an interview with Dan Gorden of THE Journal, "Full access to resources and information will help level the playing field for all students" (Gordon, 2016). This is a common theme among many scholars and educators. The belief is that if we can just get the technology into the hands of the students then the gap will shrink.

There are many studies that espouse that technology is the best and most obvious choice to close the gap for students. The use of technology in low-income and poor socioeconomic areas can help to alleviate some of the gap that minority and urban students face. The technology could be anything from laptops, tablets, and Smart technology. Often the results of these studies show significant improvements for these populations (Arnett, 2015; Barton & Coley, 2009; Hodas, 2016; Oluwatumbi, 2015; Pursell, 2009). Another study done by Judge, Puckett, & Bell (2006) discuss the need for equitable technology access for children, especially those attending high-poverty schools. However, the major difference in that study is that they discussed the need for proficient use of computers. That is really the most important aspect and where we can find the problem surrounding technology and the achievement gap.

Statement of the Problem

The problem with using technology as the great equalizer is that providing technology for technology's sake does not address the fundamental issue of accessing the technology when the students have it. As mentioned above, the need for proficiency in the use of technology to truly see a difference in achievement is paramount (Judge, et al., 2006). Neuman and Celano (2012) completed a study on whether they could see if computers really could 'level the playing field' of two different groups of neighborhood children. One group was considered to be from a concentration of affluence and the other from an area of concentrated poverty. They observed libraries in the Philadelphia area of Kensington, also known as 'the Badlands', and libraries in the Chestnut Hill section of the city. After long periods of observation on children in both libraries using technology, they observed that, "the very tool designed to level the playing field is, in fact, unleveling it" (Neuman & Celano, 2012, p. 22).

This ‘unleveling’ has more to do with the issue of education surrounding the use of technology than access to the technology itself, because the children accessing the technology were doing so in very different ways.

Paul (2014) discussed Neuman and Celano’s 2012 study and how it related to a phenomenon known as the Matthew Effect. The idea is that those who get more technology intervention early on will benefit more in the long run. This is taken as a reference from the gospel of Matthew, “For whosoever hath, to him shall be given, and he shall have more abundance: but whosoever hath not, from him shall be taken away even that he hath” (Matthew 13:12, King James Version, n.d.). There is a beginning of a new technology age of the Matthew Effect, “in which the already advantaged gain more from technology than do the less fortunate” (p. 2). Shapely, Maloney, Caranikas-Walker, and Sheehan (2008) also determined in their study of the Texas Technology Immersion Pilot that students who had higher test scores to begin with had more benefit to having technology than those who had lower test scores.

Another problem with this idea of technology and the achievement gap is that students are often admonished for using technology they are comfortable with. Students have a familiarity with their cell phones but we ban them and other devices, labeling them as ‘nuisance devices.’ Students today are born with technology in their hands. They are the cell phone generation. Pursell (2009) states, “The current generation of students is less inclined to use computers, but they use their cell phones 24 hours a day.” Why, then, is it policy that in most schools the most powerful computer a student utilizes is banned? We criminalize the use of cellphones in school and punishment for using a phone in the classroom can be very severe. It seems to be a disservice to students, especially in low-income schools, not to allow them to use their cellphones for learning, especially when other technology is not readily available.

Personal Connections and Importance

As a former Instructional Technology Coach for a low socio-economic school district, I have witnessed students struggling with when to use and when not use technology. When technology becomes available it is not used strategically. The school sees it as a tool for drill and practice of standardized tests. They use the technology for administering tests and not projects that would inspire creativity or innovation. I also saw a lack of understanding on how computers worked. Students did not have access to computers at home and did not understand how to use them in an academic setting. This is in stark contrast to my personal experiences with my children. My daughter in first grade has her own tablet and computer and the skills that she learned from using them at home have developed into positive associations with computers in her first grade classroom.

We are on the steps of a second digital divide that could cause catastrophic damage to students who are on the wrong side. Students in low socioeconomic school districts suffer from a lack of proper and reliable equipment and often lack even a connection to the Internet. I recently asked my wife, who teaches in one of these school districts, if her class could benefit from getting a few iPads to use in the classroom. She was obviously happy about this and went to her school asking for permission to put them on the network. This request was denied, as the wireless appears to be something only used by school employees. It seems counterproductive for schools to have wireless networks yet not utilize them in a way that benefits students.

Access to technology in schools is important because we have heard countless times that technology will level the playing field for students in America. If all schools could get access to technology then we could begin to close the gap between the haves and the have-nots. The most daunting challenge, however, is that we need to change the way that technology is taught in schools, and provide training to librarians, teachers, parents, and students on how to effectively use computers. Digital literacy is not something we can take for granted that people have. Neuman and Celano’s (2012) study found the following:

Without help, children can revert to random clicking - similar to the way they flipped through books. We watch as a preschooler, alone, runs her cursor over a few icons....she starts the game, but can’t follow the narrator’s directions...eventually becoming frustrated. She starts clicking away randomly...In less than two minutes, she clicks, switches, clicks, switches about 20 times. As her frustration grows, she starts pounding on the keys as if they are a piano - until the computer screen freezes. (p. 19)

This exchange provides an example of the reason we need better training for all involved with bringing technology into the lives of children. Just because a school has technology does not mean the students are getting the best that technology can offer. Schools will continue to waste money and resources if there is not proper training and assistance provided to all involved.

EDUCATIONAL LEADERS PLAN OF ACTION

Not working in a school limits what I could do, but I have a plan, based on two areas of expertise, that could help to combat the problem of improper training and assistance. One, as a former teacher in low socioeconomic schools, I can offer in-services or outlines of training for in-services, and two, I can (outline) what higher education institutions can do to increase technology training for pre-service teachers. One strategy is to work with education departments to provide training and in-services for their pre-service teachers who will be working with populations of students who fall into the low-income districts.

The in-service is a direct way to combat the lack of training for staff and teachers when technology is given to low socioeconomic schools. Often these schools do not have the technology that more affluent districts have. However, when it is provided for them, the technology is often left in the classroom and the end user is supposed to figure out how to use it. Darling-Hammond (2010) discusses the idea that we often rush individuals to obtain emergency certification and find alternatives to certification instead of taking the time to establish a framework that would effectively train our teachers, as other higher performing nations do. If we spent the time and provided for this type of education, our teachers and future teachers would be better prepared to deal with the technology in and out of the classroom.

The other issue that needs to be addressed, which would need to come from a central office as opposed to being school based, is to relax rules towards student technology use in schools. If rules change to allow more use of student technology in the classroom, specifically cell phones, then students can feel more comfortable using the technology they are familiar with. This does not need to stop at phones either, as all forms of student-owned technology, such as video game systems, could be leveraged for classroom or educational use. The possibilities for STEM alone should make this a reality. Along with students using their own devices, we can create programs that enable students to become more active and aware digital citizens. The Internet and technology can be dangerous and students are vulnerable and susceptible to malicious attacks. Part of the in-service would focus on creating digital citizens and teaching students how to make the most out of engagement in a technological world.

Plan Issues and Potential Solutions

This section will outline issues that face schools when it comes to the use of technology, as well as potential solutions that can be used to address these issues. Each area will have a potential solution that can be implemented as part of the opportunity plan

Issue 1 - Mobile Devices. As mentioned above, one negative that we see in public schools is kids being punished for using the technology that they most often use. We put stringent guidelines on cellular phones and other forms of technology that could potentially be useful in the classroom. In many studies there are findings that the use of cell phones or BYOD (Bring Your Own Device) has impacted the learning and engagement of students in a positive manner, and has not detracted from the lessons of those who have devoted time to teaching the class how to properly use the technology. Again, this is only possible if you are prepared to work with students and teach them appropriate times and uses for the devices in the classroom (Imazeki, 2014; Li, Snow & White, 2015). The key part to this potential solution is the education of the users, instructors as well as students, on using these types of technologies in the classroom. Teachers may fail to conclude that a cell phone is a distraction and may not see it as a possible a pedagogical tool.

A potential solution that should be considered by schools, and one that I would recommend to any school that I would work with, is to ease up on all-out bans of technology that students bring to school. Allowing students to use the technology that they are familiar with in a safe environment can have a positive impact. “The rise of mobile devices such as cellphones and smartphones enabled digitally deprived groups to overcome many hurdles to integrate technology into their lives” (Li, et al., p. 154).

This comes with some caveats, however. We need to educate teachers on how to deal with this type of technology in their classes as well as train students on becoming appropriate digital citizens so they can actively participate in class and ultimately society.

Issue 2 - Training and Development. Training is critical to any successful use of you technology. The support given to any new technology initiative will make or break the adaptation and incorporation of technology into teaching. Shapley, et al. (2008) discuss the impact on the final and immersive effect of technology in the classroom and how it can only be truly successful when the administration and families surrounding the schools are on board with the plan. Schools in low socioeconomic areas may do not have comparable technology to that of their counterparts in middle or higher income districts. Even when they do, the technology may sit unused because teachers have not been trained on how to use it.

As an example, the school district that I worked for was awarded an EETT grant (Enhancing Education Through Technology, part of the CFF - Classrooms for the Future). The grant provided technology to low socioeconomic districts so that each teacher could have an equal share of technology. The grant was used in my district to purchase laptops, Promethean Boards, student response systems (clickers) and other assorted tools that teachers and students could use. One provision of the grant was that it allowed for some of the funds to be used for hiring an Instructional Technology Coach. The coach would be responsible for training and assisting the teachers in finding new and innovative ways to implement the technology into their teaching. Part of this was done through building-wide inservices in which the coach was responsible for the content. This was the first time at this school in which the inservice of the day revolved around technology training. The feedback from the teachers was positive and several admitted they would have never used the technology if they had not been trained.

The potential solution for the gap in technology implementation is to create training for all who will utilize technology. This training would be for students, pre-service teachers, and teachers. Each of these people would receive specific types of training to help them get a better understanding of how to utilize technology in their school. For students, the training would need to focus on becoming a digital citizen. This would tie into allowing students greater freedom in using personal electronic devices. The training would need to take place at the beginning of the school year and be available to new students as they came in throughout the year. Students can also be recruited to help deliver the training as they reach older grades, assisting younger students in getting acclimated to using technology that is available to them. If we can get students to use technology appropriately at a younger age in the classroom, it has been shown to have a positive impact on future technology use and learning (Laidlaw & Wong, 2016). Teachers also will show more positive associations with students using technology and subsequently be more interested in using the technology themselves (Konca, Ozel, & Hikmet, 2016).

For pre-service teachers, providing a training session on best practices for using technology in the classroom, or even creating an instructional technology course, would be important for those teaching in a low socioeconomic classroom setting. Pre-service teachers may not receive training on how to use technology and may be thrust into situations where they are expected to use technology in their teaching. Yurtseven Avci, Eren, and Seckin Kapucu (2016) discussed the need to have training on technology tools for pre-service teachers prior to them going into the classroom. They found that many struggled from the start with using the technology, but by the time they were done training, they understood the advantages of using technology in the classroom. Middle and higher socioeconomic schools tend to spend more time with training teachers on how to use technology in their districts and therefore have less need to have teachers come in with prerequisite knowledge. New teachers in lower socioeconomic schools who have never used technology or seen it used will find it daunting to do what they need to do as first-year teachers, on top of learning how to incorporate technology. Relying on them to learn how to do both, teach and use technology, only serves to widen the achievement gap.

For teachers, providing in-service training on technology should be considered mandatory. However many schools are more focused on making sure their staffs are trained on delivering tests and managing behavior in the classrooms.

Having a commitment from schools to provide training for teachers on technology for at least a half a day of in-service, two to three times a year, would serve to improve technological skills, ability, and confidence in teachers. If more weight was given to the training provided to teachers on technology, there will surely be improvements for all stakeholders; teachers and students alike (Thorsteinsson, 2012).

Resources Required

Technology for low socioeconomic schools is a significant need, but is not the focus here. The resources that I will require to fulfill the potential solutions are:

- Time
- Commitment
- Money
- People

The two most important resources required are time and commitment. Time is needed for trainings and in-services so that teachers and students can get acclimated to technology and gain the understanding that technology can be used for educational gains. The other resource, commitment, is required of students to be good digital citizens. A time commitment from pre-service teachers and teachers alike to learn how to use the technology they have and make sure it is not going to waste or being misused would be time well-spent.

The other resources on the list, money and people, are also closely related. Money will be needed to purchase programs or other related ideas. People performing and present at in-services may also need to be paid. Often times there is minimum funding available so there is a need to make sure professional development money is set-aside for those half days if needed. As was the case in my school, grants will be key to funding technology initiatives, especially for people to help provide training and supplies for that training. If I were in a leadership position at the school, I would work to find partnerships and grants that would help to alleviate some of the associated costs.

In terms of the program within higher education, all that would be needed is time. Time will be required of the education department to provide a place and commit to their pre-service teachers taking this training. Ultimately, I would like to see this become part of an actual technology course in the education department, as it would benefit those who are still learning to become teachers. This course would then have a money addition for development and eventual salary for the instructor. In the future, planning a course around the use of technology in education is a big step in completing this plan. The course will have a large section dedicated to understanding the achievement gap and how technology can be either a barrier or stepladder. To start, this type of conversation and training can easily be incorporated into the teacher preparation courses that undergraduate students work on while they are student teaching, giving them an opportunity to discuss what they are seeing in schools and how technology can be used to help the students.

Timeline

K-12 In-service. This plan will need to be ongoing. For school districts, they will need to continually run the in-services year after year for the benefits to truly begin to show. The student training will also be required yearly. The programs will need to be revamped on a yearly basis to account for changes in technologies and requests for programming. The following tables outline a possible schedule of student and teacher training for technology use.

Trainee	Training Program	Timeline
Students	Digital Citizenship Presentation for students at the beginning of the school year. Topics include: Proper use of cellphone in school, Being a 21st Century Learner, Cyberbullying, and Digital Footprints	As new students come in, upper class students can be used to provide direction when needed.

Trainee	Training Program and Timeline		
Teachers	Prior to the beginning of the school year, half of one in-service day will be dedicated to technology conversations. What do we want to accomplish throughout the year with using technology? How can we use technology to engage and inspire students?	A second half-day in-service will need to be dedicated to revisiting the goals laid out in the preschool year in-service. This should take place sometime in November to see where the technology needs are. Adjustments can be made accordingly.	A third half day in-service will take place in March or early April to begin to look at how the year went and what needs to be looked at for the next school year. Summer workshops on technology could be planned at this point and a future technology topic can be introduced for the following school year.

Pre-service Teachers. In terms of pre-service teachers, the plan listed will take less time up front. It will only require supervisors for student teaching to make time in their class for the training to happen. The program could be developed over the following semester and be presented to new student teachers the following fall. The course proposal would take a bit longer as it would need to be planned and presented for approval by both the School of Education and the academics committee. This could be done over the next year to a year and a half. This would be desirable as currently there is no sole instructional technology course available for pre-service teachers to take.

IMPLICATIONS

This plan was developed with the understanding that I currently am not involved with any school or district. However, the first part of the potential plan could be carried out by any instructional leader in those areas if they had a background in technology. The second part of the potential plan is more focused on training preservice teachers in higher educational environments. The implications of both parts are tremendous for low socioeconomic schools and districts. The potential plan for the in-services and students' use of technology can drastically change how students learn in the classroom. By allowing teachers and students to have the opportunity to use technology they know and teaching them how to use it properly, the achievement gap can begin to be closed. Hopefully this type of program can be replicated for other districts suffering from the same type of situation. In terms of the potential plan for higher education, many universities fail to adequately train their pre-service teachers on how to use technology in the classroom and how to use it properly when they are faced with working in districts that are lower in socioeconomic status. Providing the training as Yurtseven Avci et al. (2016) stated will increase, "student engagement, active participation, reinforcement, deeper understanding, and development of imagination skills" (p. 19). This program/course could easily be transferred to other institutions that are dealing with the same kind of issues for their pre-service teachers.

CONCLUSION

When I first began looking at topics, I felt certain that I wanted to look at technology and how it has affected the achievement gap. Upon my research, I discovered that there were many studies out there that discussed how technology is widening the gap due to lack of training, not just the lack of physical technology resources. With this newfound knowledge, I set off discovering how to best tackle this problem. With proper training for all participants; students, pre-service teachers, teachers, and even administrators, we can begin to reverse the Matthew Effect taking hold in our schools and help to close the achievement gap.

REFERENCES

- Arnett, T. (2015, October 23). Can technology solve the achievement gap? Retrieved December 1, 2016, from <http://www.christenseninstitute.org/blog/can-technology-solve-the-achievement-gap/>
- Barton, P. E., & Coley, R. J. (2009). *Parsing the Achievement Gap II. Policy Information Report*. Educational Testing Service. Retrieved from <http://eric.ed.gov/?id=ED505163>
- Clark, K. (2003). Impact of Technology on the Academic Self-Efficacy and Career Selection of African American Students. *Information Technology in Childhood Education*., 79–89.
- Darling-Hammond, L. (2010, May 27). Restoring Our Schools. *The Nation*, (June 14, 2010). Retrieved from <https://www.thenation.com/article/restoring-our-schools/#>
- Darling-Hammond, L., Zieleszinski, M., & Goldman, S. (2014, September 10). Using Technology to Support At-Risk Students' Learning | Stanford Center for Opportunity Policy in Education. Retrieved December 1, 2016, from <https://edpolicy.stanford.edu/publications/pubs/1241>
- Gordon, D. (2016, April 28). Technology's Role in Closing the Achievement Gap -. Retrieved December 1, 2016, from <https://thejournal.com/articles/2016/04/28/technologys-role-in-closing-the-achievement-gap.aspx>
- Hodas, S. (2016). *Changing Methods and Mindsets: Lessons from Innovate NYC*. Center on Reinventing Public Education. Retrieved from <http://eric.ed.gov/?id=ED563476>
- Imazeki, J. (2014). Bring-Your-Own-Device: Turning Cell Phones into Forces for Good. *Journal of Economic Education*, 45(3), 240–250.
- Judge, S., Puckett, K., & Bell, S. M. (2006). Closing the Digital Divide: Update from the Early Childhood Longitudinal Study. *Journal of Educational Research*, 100(1), 52–60.
- Konca, A. S., Ozel, E., & Zelyurt, H. (2016). Attitudes of Preschool Teachers towards Using Information and Communication Technologies (ICT). *International Journal of Research in Education and Science*, 2(1), 10–15.
- Laidlaw, L., & Wong, S. S.-H. (2016). Literacy and Complexity: On Using Technology within Emergent Learning Structures with Young Learners. *Complicity: An International Journal of Complexity and Education*, 13(1), 30–42.
- Li, J., Snow, C., & White, C. (2015). Urban Adolescent Students and Technology: Access, Use and Interest in Learning Language and Literacy. *Innovation in Language Learning and Teaching*, 9(2), 143–162. <https://doi.org/10.1080/17501229.2014.882929>
- Matthew 13:12 KJV. (n.d.). Retrieved December 1, 2016, from <https://www.kingjamesbibleonline.org/Matthew-13-12/>
- Neuman, S. B., & Celano, D. C. (2012). Worlds Apart: One City, Two Libraries, and Ten Years of Watching Inequality Grow. *American Educator*, 36(3), 13.
- Oluwatumbi, O. S. (2015). E-Classroom of the 21st Century: Information Gaps. *Journal of Education and Practice*, 6(18), 67–71.
- Paul, A. M. (n.d.). Is Technology Widening Opportunity Gaps Between Rich And Poor Kids? Retrieved December 1, 2016, from <https://ww2.kqed.org/mindshift/2014/06/27/is-technology-widening-opportunity-gaps-between-rich-and-poor-kids/>
- Pursell, D. P. (2009). Adapting to Student Learning Styles: Engaging Students with Cell Phone Technology in Organic Chemistry Instruction. *Journal of Chemical Education*, 86(10), 1219–1222.

- Shapley, K., Maloney, C., Caranikas-Walker, F., & Sheehan, D. (2008). *Evaluation of the Texas Technology Immersion Pilot: Third-Year (2006-07) Traits of Higher Technology Immersion Schools and Teachers*. Texas Center for Educational Research. Retrieved from <http://eric.ed.gov/?id=ED536301>
- Shapley, K., Sheehan, D., Maloney, C., & Caranikas-Walker, F. (2008). *Evaluation of the Texas Technology Immersion Pilot: Outcomes for the Third Year (2006-07)*. Texas Center for Educational Research. Retrieved from <http://eric.ed.gov/?id=ED536294>
- Shapley, K., Sheehan, D., Maloney, C., & Caranikas-Walker, F. (2009). *Evaluation of the Texas Technology Immersion Pilot: Final Outcomes for a Four-Year Study (2004-05 to 2007-08)*. Texas Center for Educational Research. Retrieved from <http://eric.ed.gov/?id=ED536296>
- Shapley, K., Sheehan, D., Sturges, K., Caranikas-Walker, F., Huntsberger, B., & Maloney, C. (2006). *Evaluation of the Texas Technology Immersion Pilot: An Analysis of the Baseline Conditions and First-Year Implementation of Technology Immersion in Middle School*. Texas Center for Educational Research. Retrieved from <http://eric.ed.gov/?id=ED536299>
- Thorsteinsson, G. (2012). Using ICT for Training Teachers in Design and Technology Education (TTDTE). *Journal of Educational Technology*, 9(3), 9–13.
- Walach, M. (2015). Measuring the Influences That Affect Technological Literacy in Rhode Island High Schools. *Journal of Technology Education*, 27(1), 56–77.
- Yurtseven Avci, Z., Eren, E., & Seckin Kapucu, M. (2016). Practical Tools for Content Development: Pre-Service Teachers' Experiences and Perceptions. *International Journal of Instruction*, 9(2), 19–34.

Terrain Area Estimation by Using Polygons Based on Visual Lisp

Marco TACURI

*Unidad Académica de Ingeniería Civil
Universidad Técnica de Machala
Ecuador
mtacuri@utmachala.edu.ec*

Eduardo TUSA

*Unidad Académica de Ingeniería Civil
Universidad Técnica de Machala
Ecuador
etusa@utmachala.edu.ec*

César SOLANO

*Unidad Académica de Ingeniería Civil
Universidad Técnica de Machala
Ecuador
csolano@utmachala.edu.ec*

ABSTRACT

This work presents a computer program that calculates the terrain area raised by polygons using programming in AutoCAD based on Visual LISP. The angles and distances between each station and the corresponding detail points (if any) must be obtained in the field with theodolite or total station, in order to make the adjustment of the closed traverse, which consists of correcting the angle readings, transforming these angle readings from the stations to azimuths, obtaining and correcting the east-north projections, and evaluating the type of topographical survey performed. Thus, we obtain the final coordinates which allows us to compute the land area with its corresponding graph. The results of the calculation and traverse adjustment, as well as the coordinates obtained, are compared with an Excel spreadsheet. This application offers a better alternative to electronic sheets used in topography, because users do not have to modify the data structure and formulas, but only worry about data collection. It will also encourage undergraduate students of Civil Engineering to develop their own functions or commands for AutoCAD and add them to the existing native functions, in order to optimize the time not only in drawing but in different related disciplines.

INTRODUCTION

Historically, the relief portrayal develops hand in hand with progress in solving the problems of topographic relief measurements. (Collier, Forrest, & Pearson, 2003). Surface topography is one of the leading factors affecting wear processes (Jeng & Gao, 2000). As geodetic surveying is one of the first subjects related to civil engineering courses, it is essential to gradually familiarize students with the subject and clarify its relationship to their specialty (Ustinova, Kala, Mill, & Ellmann, 2012). The increased area of land surface compared with its projected area, is an effect of topographic relief and it is also a source of environmental variations (Ying, Shen, Piao, Liu, & Malanson, 2014).

According to (Alcántara, 2014) Topography is a science that determines relative or absolute positions of the points on the Earth. It studies the methods and procedures to make measurements on the ground and to represent graphically or analytically to a specific scale. We apply Topography in various areas such as: electrical, agricultural, civil, mining engineering, etc. One of the applications in civil engineering is to determine the terrain area; which can be obtained by these methods: visual intersection, radiation or polygonal. In this research work, we choose the polygonal method because we can measure relatively large areas with the presence of obstacles between stations. Topographic survey (Wirshing & Wirshing, 1987), determines the positions of the different natural features (configuration) of the terrain, as well as details or points of interest made by the man, all these on the earth's surface.

For the infrastructure construction, it is necessary to know the land extension and topography, where engineers build them. When an extension is relatively large, we use measuring devices that allow us to obtain the field area with greater accuracy. These surveying devices measure angles (degrees, minutes, and seconds) and distances in the field. With these data, we do cabinet work to realize the calculation and adjustment of the polygonal. Data processing, with the use of computational tools, allows to obtain knowledge of data to overcome complexity problems, external and self-relations between the same data (Castro, Sifuentes, González, & Rascón, 2014).

Figure 1 shows the irregular terrain representation. The letters in upper case correspond to the stations of each vertices of the polygon. The points located in the green line are delimiting the terrain to be measured, which are called details by radiation. As can be seen in the Figure 1, the stations can have different amounts of detail points, which makes it difficult to perform a procedure in any spreadsheet, since the user must permanently make changes in the structure, such as add or delete rows or columns, change the range of cells, formulas, etc. We overcome this inconvenience with the help of a programming language. When there are details by radiation, the program must automatically evaluate how many details exist for each station and make the corresponding calculations.

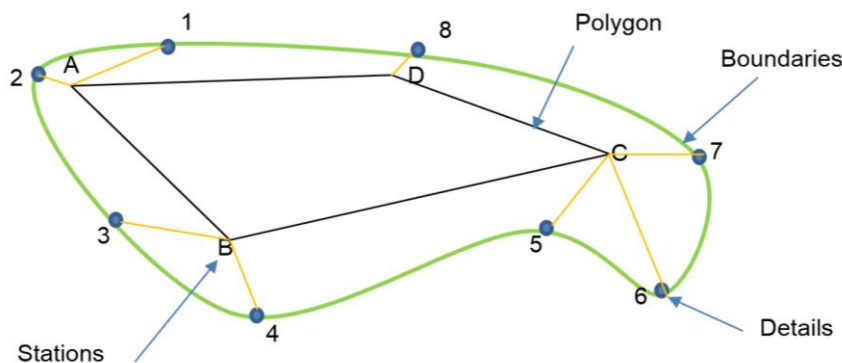


Figure 1: Irregular terrain representation by identifying four elements: Stations, polygon, details and boundaries.

Since few decades ago, the use of computational resources has become an important issue for the sciences (Rojas, Morales, Rangel, & Torres, 2009); so there arose the need to develop a program applied to Topography in one of the software most used by Engineers and Architects worldwide as AutoCAD, using programming in Visual Lisp. Since no other major programming languages is able to manipulate so easily the types of objects with we work in CAD (Togores & Otero, 2003). Planners use computer aided design and drafting programs primarily to produce drawings or plans that illustrate development proposals (Brown & Schoen, 1987).

With Visual Lisp we can create user-defined functions and add them to the native language. We can create a function called "gate" and at the moment you type "gate" in the command line draw this one automatically with just two or three clicks, which optimizes the time in the drawing. Also, by entering the internal database of AutoCAD can have complete control of all native functions, being able to edit an already drawn plane and modify existing objects without needing to touch them.

The ability to handle dimensional and spatial information through computers, utilizing computer aided drafting (CAD) programs, has also become significant (Dallas, 2003). Information and communication technologies (ICT) have become essential elements that drive positive changes in the world economy and society (Marcano-Rojas, 2015). Within the fundamental characteristics of the ICT in front of the so-called traditional techniques of experimentation and measurement, we can cite: a) greater accuracy and precision in general; b) higher speed and / or frequency of data acquisition; c) possibility of processing data online, or immediately; and d) almost automatic obtaining graphical and numerical results (Enrique & Alzugaray, 2013).

The objective of this research work is to develop a program that allows to calculate and plot the terrain area raised by polygons with their corresponding details by radiation, using the programming language Visual Lisp for AutoCAD. The paper is organized as follows: Section 2 describes the methodology, section 3 discusses the experimental results. Finally, section 4 concludes the paper and provides possible directions for future work.

METHODOLOGY

When it is desired to obtain the area of a relatively large terrain with precision, topographic apparatus must be used and the method used for its measurement is the polygonal, which consists in carrying out the following steps:

Step 1: We locate each station, which as much as possible should follow the boundary of the terrain.

Step 2: We park the device in each station, measuring the angle (degrees, minutes and seconds) between the previous and next station, in addition to the distance between them. These angles can be inside or outside, taking into account the path direction:

$$(n - 1) \times 180 \quad \text{Counterclockwise path} \quad (1)$$

$$(n + 2) \times 180 \quad \text{Clockwise path} \quad (2)$$

where n represents the number of stations.

Step 3: We must obtain additional points (details by radiation) with their corresponding angles and distances, which must be in the terrain boundary; if the stations cannot be located in the boundary due to terrain irregularities.

Once we carried out field survey and we obtained the station data: angles and distances with their corresponding details, we proceed to the cabinet work and the automation of these processes using the Visual Lisp language, which is incorporated in AutoCAD software. It is necessary to mention that the automation of a certain task, the programmer besides knowing the syntax of the language added to his skill and insight; we need to know in depth how the mechanical procedure is performed.

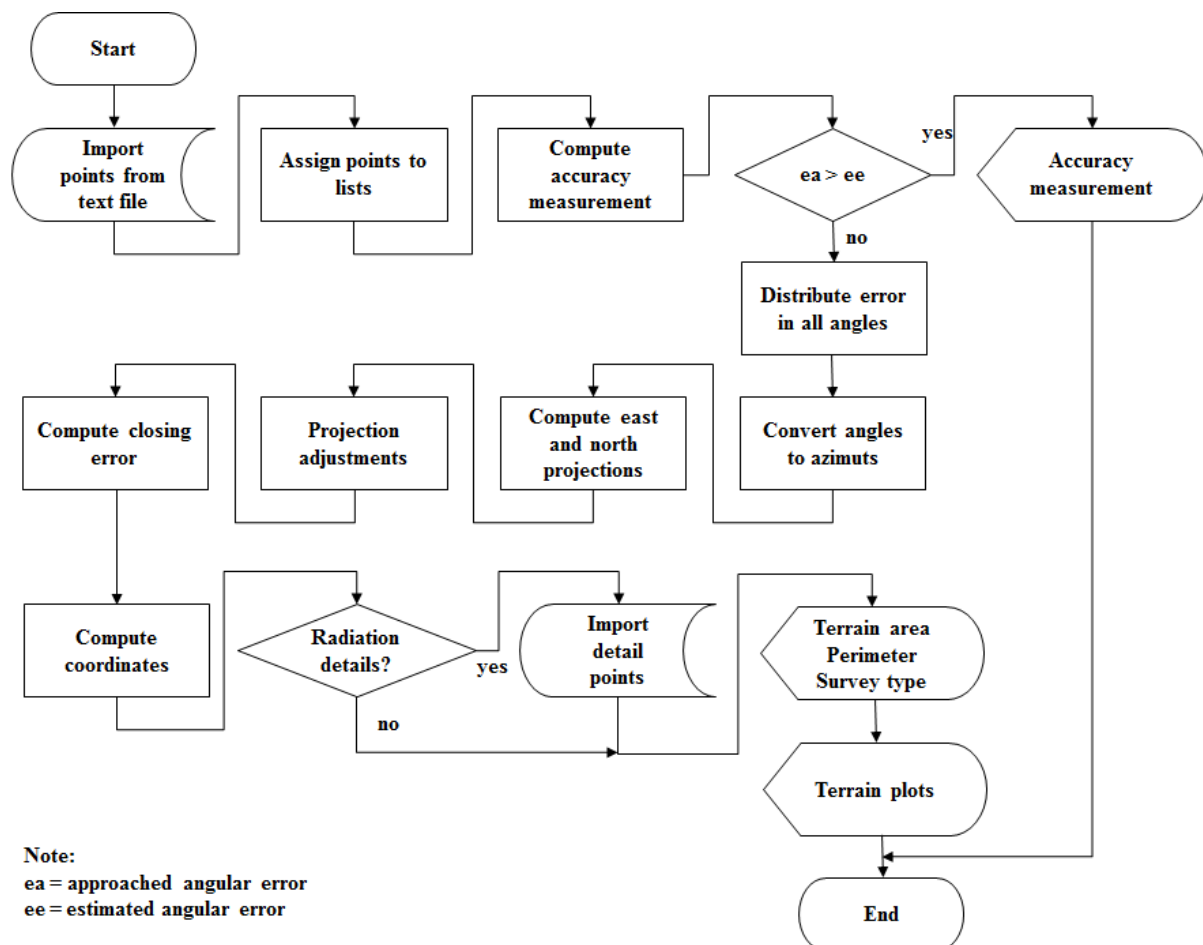


Figure 2: Computer program flowchart

When the ground extension to be surveyed is relatively large, we use enough stations and detail points. By entering this data in the AutoCAD command line, it is time consuming, arduous and tedious task. It is solved by previously entering the data in a text file, so that from AutoCad can import these points directly in the style of how AutoCad Civil 3D does.

When we perform applications for AutoCAD, we must open the software and from there, we call the developed function, in this case, we enter the application should by typing in the command line the word "polygonal", which it shows the graphical interface of the program developed with the Dialogue Control Language (DCL). The buttons highlighted in gray are the command buttons that execute commands when the user selects them. Visual Lisp does not have functions or controls that allow to create or draw objects directly. It does not have a graphical user interface like other languages like Visual Basic, Visual C, Matlab, etc., have it. To solve this problem, Visual Lisp use the DCL language to create this interface, with the novelty that the controls cannot be drawn in design mode, but are created by code. Figure 3 shows the forms and procedures performed on each button.

Figure 3: Graphical interface developed in the DCL language

Import Points button: Before using this button, user must previously have entered the data corresponding to the topographic survey carried out in the field in a text file; where each line of the text file corresponds to the data of each station (degrees, minutes, seconds, distance and number of points of detail for each station). Each line consists of five columns, which must be separated by the tab key as we see in Figure 4. In the text file, we enter the angles (degrees, minutes and seconds) from the second station, and in the last two columns, the data from the previous station and so on until the last one, which in this case would be the first one, because the income was started from the second.

Estación	Grados	Minutos	Segundos	Distancia (m)
172	3	33	94.7	2
168	14	50	81.15	1
184	36	50	80	1
180	14	22	89.64	1
185	59	27	58.77	1
128	49	20	30.53	1
204	26	0	32.32	2
186	44	0	82.9	1
147	25	40	44.78	1
162	41	40	35.35	1
195	49	40	78.7	1
70	38	40	65.25	1
174	50	20	48.27	1
179	53	40	57.9	1
188	3	20	75.39	1
172	31	20	44.1	1

Figure 4: The data of the text files correspond to a topographic survey, taken from a plot located in the sector “El Retiro”, near the Santa Rosa city, Province of El Oro, Ecuador; from which, we obtain 30 stations with their corresponding details by radiation.

The syntax for calling the text file from Visual Lisp when the user selects the Import Points button is:
(setq pointsdetails (getfiled "Detail points file" "root directory" "txt" 0))

In the text boxes of the graphical interface corresponding to degrees, minutes and seconds; we enter the azimuth of the line between station 1 and 2.

The imported data is stored in three lists: the first list contains the angles (grouped in degrees, minutes and seconds); the second list stores the distances and the third list corresponds to the number of detail points for each station. In this process, the functions for creation and access to lists such as: *cons*, *car* and *nth*. Then in an interface list control, we observe the imported angles. The code where the first list is created is:

(setq listangobs (cons (+ (nth 0 (car line)) (/ (nth 1 (car line)) 60.0) (/ (nth 2 (car line)) 3600.0)) listangobs))

Next, we calculate and adjust the polygonal by starting with the angular error and using the formula:

$$e = a \times n \quad \text{low precision survey} \quad (3)$$

$$e = a \times \sqrt{n} \quad \text{high precision survey} \quad (4)$$

where e is the angular error, a is the device precision and n is the number of stations.

The sum of the angles must be according to equations (1) or (2), and considering the path direction. Due to inaccuracies in both the measurement and the apparatus, this sum is not going to be equal. This discrepancy must be less than or equal to equations (3) or (4). If error is very small, it is distributed in all the station angles, otherwise; the observed angles in the field must be rectified.

The observed angles are converted to azimuths and we compute the east and north projections. If the summation of these projections is different from zero, the error must be distributed in each projection. We calculate the projection by using the sine function and the north, by applying the cosine function, as follows:

(setq listpe (cons (* (nth i listdistancia) (sin (/ (* (nth i listazimut) pi) 180))) listpe))
(setq listpn (cons (* (nth i listdistancia) (cos (/ (* (nth i listazimut) pi) 180))) listpn))

We compute the total error, \mathcal{E} , by using the equation (5)

$$\mathcal{E} = \sqrt{\delta_e^2 + \delta_n^2} \quad (5)$$

where δ_e is the summation of east projections and δ_n is the summation of north projections. Depending on the accuracy, Table 1 must be considered.

Maximum error	Survey type
1:800	Topographic survey of irregular and low-value land, surveying, settlements, etc., usually done by tachymetry.
1:1000 a 1:1500	Survey of low-value land; tachometer for double sight readings.
1:1500 a 1:2500	Survey of agricultural land of average value. Surveying with stay.
1:2500 a 1:4000	Urban surveys and rural lands of a certain value.
1: 4000 onwards	Survey in cities and lots of valuable land.
1:10000 and beyond	Geodetic surveys.

Table 1: Classification of survey based on maximum error (Torres & Villate, 2001)

With the corrected east and north coordinates, we obtain the final coordinates sequentially by summing the values of the previous ones. From these, we plot the polygon and its area. Since each coordinate is stored in a list in Visual Lisp, all of them must be stored in a list of higher hierarchy to be able of accessing with predefined functions. The final list of coordinates will have as a sublist, the coordinates of each station. To make a list with the final coordinates, we use the instruction:

(setq listacoord (mapcar '(lambda (x y) (list x y)) coordeste coordnorte))

Calculate button: This routine calculates the final coordinates to plot the polygon. In this loop, the routine begins by assigning a certain value to the first station, which must be added to the following partial coordinates. If the following coordinates take negative values, the loop is restarted, increasing by 20, the assumed value at start; this loop end when all coordinates are positive.

For the area calculation, we use the matrix formula in which the x and y coordinates becomes the east and north coordinates, where:

$$Area = \frac{1}{2} \begin{vmatrix} e_1 & n_1 \\ e_2 & n_2 \\ e_3 & n_3 \\ \vdots & \vdots \\ e_n & n_n \\ e_1 & n_1 \end{vmatrix} = (e_1 n_2 + e_2 n_3 + \dots + e_{n-1} n_n + e_n n_1) - (e_2 n_1 + e_3 n_2 + \dots + e_n n_{n-1} + e_1 n_n) \quad (6)$$

where e_i represents the i th east coordinates and n_i is the i th north coordinates and $1 \leq i \leq n$. When we execute these routines, the entire polygonal fit will be displayed in the "Results" box. The corrected angles and final coordinates representing the polygon vertices will appear in the list interface boxes. The system evaluates the type of survey performed. It means, in case of many measurement errors and data are not according to certain ranges (see Table 1), the system suggests to the user to repeat the survey again.

Graph Button: We use the following instruction to plot the coordinates and to join each one of the points:

(command "_line" x1 y1 "")

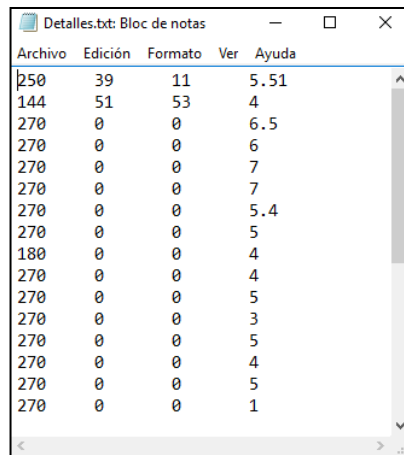
where $x1$ is the list that stores the values of the east coordinates and $y1$ is list that stores the values of the north coordinates. The "_line" command lines each coordinate, which must be contained in a loop that will be repeated according to the number of coordinates in the list. Thus, we display a polygon representing the shape of the measured terrain.

Save Coordinates Button: We save the coordinates in a text file in order to be able to transport them and use them in other computers with AutoCAD. The save option is presented in a dialog box similar to when we use the Import Points button. The main instructions are:

(setq filename (getfiled "Detail point file" "root directory" "txt" 1))
(setq desarchivo (open nomarchive "w"))

Open Coordinates Button: When there are coordinates that have been previously saved in a text file, this button opens a dialog box for the user to select the file containing the final coordinates calculated in a previous survey to be able to plot them. The instruction used is similar to the one performed on the Import Points button.

Radiation Detail Button: Before selecting this button, all other detail points (degrees, minutes, seconds and distance) that exist in each station should be saved in a similar way as in the first one. Unlike the entry made in the first text file, it must enter the data from the first station. The order of entry for this data must be done as shown in Figure 1, if measurements are taken counterclockwise.



Estación	Grados	Minutos	Segundos	Distancia (m)
250	39	11	5.51	
144	51	53	4	
270	0	0	6.5	
270	0	0	6	
270	0	0	7	
270	0	0	7	
270	0	0	5.4	
270	0	0	5	
180	0	0	4	
270	0	0	4	
270	0	0	5	
270	0	0	3	
270	0	0	5	
270	0	0	4	
270	0	0	5	
270	0	0	1	

Figure 5: Radiation details of each station

We perform the whole calculation at the same procedure. The program reads the number of details corresponding to each station, converting the angles to azimuths, and getting the east and north coordinates with the distances using the formula (5) and (6), which are to replace the coordinates of the corresponding station.

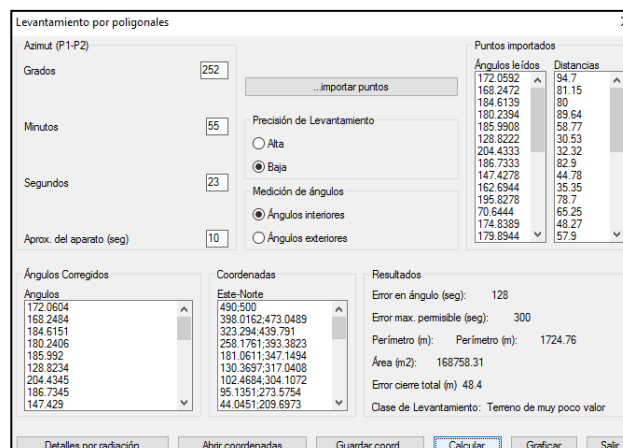
This procedure requires nested loops, where the first is repeated according to the number of stations and the second internal loop is repeated according to the amount of details in each station.

In the web, there are electronic sheets that perform the calculation and adjustment of a closed traverse for a determined number of stations. When these stations increase or decrease, the operator must modify and edit the corresponding formulas, without mentioning the radiation details that must be taken into account at each station. This problem is solved with the development of our software, since all the processes are performed within a cycle (loop) that automatically runs as many stations or details data exist.

RESULTS

Once the coding, compilation, execution and debugging phases are completed, the application is able to plot, with its respective details by radiation the terrain shape and the total area. In addition to this, the results obtained evaluate the quality of the survey carried out; that is, performs the adjustment of the polygonal, providing the closing error in angles to determine the accuracy of the measurement, the correction of the east - north projections, the length of the polygonal and the closing error to establish the type of survey (low value, agricultural land, rural - urban, valuable lands, geodesics, etc). While it is true, there are modern topographical apparatus such as the total station that locates the x , y , z coordinates; and with the help of integrated software it calculates angles, distances, areas, elevations; but it does not make the adjustments mentioned previously.

Figure 6: Results obtained considering data from the polygon only.



Levantamiento por poligonales

Azmut (P1-P2): 252

Grados: 55

Minutos: 23

Segundos: 10

Aprox. del aparato (seg): 10

...importar puntos

Precisión de Levantamiento

☐ Alta

☒ Baja

Medición de ángulos

☒ Ángulos interiores

☐ Ángulos exteriores

Puntos importados

Ángulos leídos	Distancias
172.0592	94.7
168.2472	81.15
184.6139	80
180.2394	89.64
185.9908	58.77
128.8222	30.53
204.4333	32.32
186.7333	82.9
147.4278	44.78
162.6944	35.35
195.8278	78.7
70.6444	65.25
174.8389	48.27
179.8944	57.9

Ángulos Corregidos

172.0604
168.2484
184.6151
180.2406
185.992
128.8234
204.4345
196.7345
147.429

Coordenadas

Este-Norte
490.500
398.0162.473.0489
323.294.439.791
258.1751.393.3823
181.0611.347.1494
130.3697.317.0408
102.4684.304.1072
95.1351.273.5754
44.0451.209.6973

Resultados

Error en ángulo (seg): 128

Error max. permisible (seg): 300

Perímetro (m): 1724.76

Área (m²): 168758.31

Error cierre total (m): 48.4

Clase de Levantamiento: Terreno de muy poco valor

Detalles por radiación | Abrir coordenadas | Guardar coord. | **Calcular** | Graficar | Salir

Figure 6 shows the closing error at angles of 128 sec. is less than the permissible maximum of 300 sec; but the closing error in meters is high, 48.4 m. For this reason, the type of survey is classified as a land of very low value. Figure 7 presents the polygon shape displayed in AutoCAD.

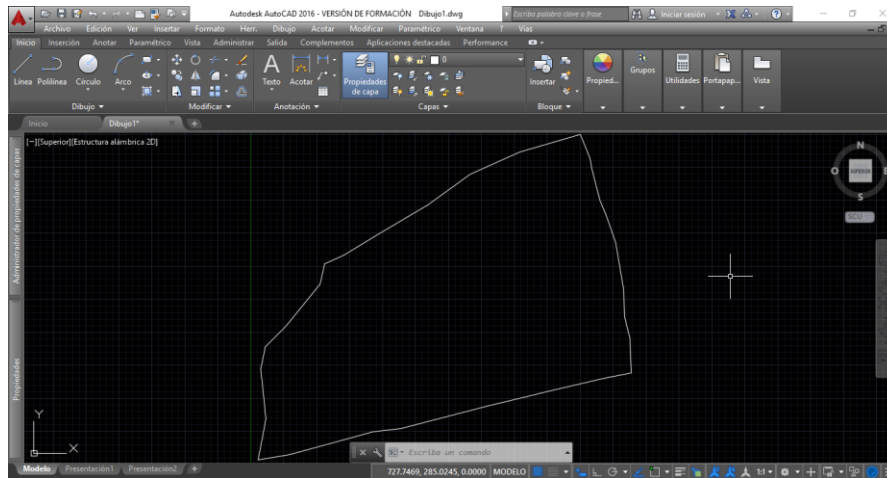


Figure 7: Polygon plot in AutoCAD

If we consider details by radiation as we see in Figure 8, the terrain area increases to 174713.9 m² from 168758.31 m², which produces a relative difference of 5955.55 m².

Levantamiento por poligonales

Azmut (P1-P2)
Grados: 252
Minutos: 55
Segundos: 23
Aprox. del aparato (seg): 10

...importar puntos

Precisión de Levantamiento
☐ Alta
☒ Baja

Medición de ángulos
☒ Ángulos interiores
☐ Ángulos exteriores

Puntos importados	
Ángulos leídos	Distancias
172.0592	94.7
168.2472	81.15
184.6139	80
180.2394	89.64
185.9908	58.77
128.8222	30.53
204.4333	32.32
186.7333	82.9
147.4278	44.78
162.6944	35.35
195.8278	78.7
70.6444	65.25
174.8389	48.27
179.8944	57.9

Ángulos Corregidos
172.0604
168.2484
184.6151
180.2406
185.992
128.8234
204.4345
186.7345
147.429

Coordenadas
Este-Norte
490.500
398.0162;473.0489
323.294;439.791
258.1761;393.3823
181.0611;347.1494
130.3697;317.0408
102.4684;304.1072
95.1351;273.5754
44.0451;209.6973

Resultados
Error en ángulo (seg): 128
Error max. permisible (seg): 300
Perímetro (m): 1724.76
Área (m²): 174713.9
Error cierre total (m) 48.4
Clase de Levantamiento: Terreno de muy poco valor

Detalles por radiación | Abrir coordenadas | Guardar coord. | Calcular | Graficar | Salir

Figure 8: Results obtained considering details by radiation.

CONCLUSIONS

The use of this computer program seeks that students and professionals involved construction project, they can reduce their work and time for data processing in order to obtain the calculation and adjustment of the polygonal in a timely manner. The user concern focuses on entering the data into the text file.

We can add more functionality to the program, such as extending it so that you can perform altimetry surveys; so we can develop more complex programs such as editing a shape already drawn in AutoCAD, reading each attribute and properties of graphic and non-graphic entities for the purpose of quantifying materials and obtaining work budgets.

Many construction professionals think that AutoCAD is designed for digital drawing only, when it actually has the second-oldest programming language such as Visual Lisp, which allows us to develop robust applications for engineering and architecture.

REFERENCES

- Alcántara, D.G. (2014). Topography and its Applications. Mexico, D. F. : Larouse.
- Brown, D. F., & Schoen, D. A. (1987). Using Microcomputer CAD Packages in Planning. *Journal of the American Planning Association*, 53(2), 249–258. <https://doi.org/10.1080/01944368708976659>
- Castro, A., Sifuentes, E., González, S., & Rascón, L. H. (2014). Use of Data Mining in the management of Geographic Information. *Technological Information*, 25 (5), 95-102. <https://doi.org/10.4067/S0718-07642014000500014>
- Collier, P., Forrest, D., & Pearson, A. (2003). The Representation of Topographic Information on Maps: The Depiction of Relief. *The Cartographic Journal*, 40(1), 17–26. <https://doi.org/10.1179/000870403235002033>
- Dallas, R. (2003). Measured surveys of historic buildings: user requirements and technical progress. *Journal of Architectural Conservation*, 9(2), 58–81. <https://doi.org/10.1080/13556207.2003.10785343>
- Del vast, H. P. (2015). Influence of information and communication technologies (ICT) in the process of learning-learning. *General Scientific Journal José María Cordova*, 3.
- Enrique, C. M., & Alzugaray, G. E. (2013). Teaching-Learning Model for the Study of the Kinematics of an Inertial Flywheel using Information and Communication Technologies in a Physics Laboratory. (Spanish). Learning-Teaching Model for Studying the Kinematics of an Inertial Steering Wheel Using Information and Communication Technologies in a Laboratory of Physics. (English), 6 (1), 3-12. <https://doi.org/10.4067/S0718-50062013000100002>
- Jeng, Y. R., & Gao, C. C. (2000). Changes of surface topography during wear for surfaces with different height distributions. *Tribology Transactions*, 43(4), 749–757. <https://doi.org/10.1080/10402000008982404>
- Marcano-Rojas, I. R. (2015). Appropriation of information and communication technologies in the Venezuelan educational field. *Journal Educación*, 39 (1), 121-136.
- Oropeza, C.L., & Lezama, J.A. (2007). Dependency and Linear Independence: A proposal of activities for the classroom. *Electronic Journal of Research in Education in Sciences*.
- Rojas, J.F., Morales, M.A., Rangel, A., & Torres, I. (2009). Computational physics: An educational proposal. *Revista Mexicana de Física E*, 55 (1), 97-111.
- Togores, R. F., & Otero, C. G. (2003). Programming in AutoCad with Visual Lisp. Madrid: MacGraw-Hill / Interamericana.
- Torres, A. N., & Villate, E.B. (2001). Topography. Bogotá: Colombian School of Engineering.
- Ustinova, N., Kala, V., Mill, T., & Ellmann, A. (2012). Geodetic surveying studies for civil engineering students at Tallinn University of Technology. *Geodesy and Cartography*, 38(2), 86–91. <https://doi.org/10.3846/20296991.2012.692213>
- Ying, L. X., Shen, Z. H., Piao, S. L., Liu, Y., & Malanson, G. P. (2014). Terrestrial surface-area increment: The effects of topography, DEM resolution, and algorithm. *Physical Geography*, 35(4), 297–312. <https://doi.org/10.1080/02723646.2014.886923>
- Wirshing, J.R., & Wirshing, R. H. (1987). Introduction to Surveying. Mexico, D. F. : MacGraw-Hill.

The ‘Booktuber’ Practice as a Teaching-Learning Medium in Journalistic Writing Classes

Fernanda TUSA

Center of Investigations

Technical University of Machala

Ecuador

ftusa@utmachala.edu.ec

Tomas FONTAINES-RUIZ

Center of Investigations

Technical University of Machala

Ecuador

Eduardo TUSA

Center of Investigations

Technical University of Machala

Ecuador

ABSTRACT

Inside the general topic called 'Construction of meaningful learning' the present research paper analyzes a proposal of a case study based on classroom good practice with fourth semester' students of the Social Communication career at the Technical University of Machala (Utmach), in the first half of year 2017. Is important to mention that Utmach is a Higher Education Institution located in the south of Ecuador, bordering with Peru country. Besides, this Booktuber practice was used for 35 students of the selected sample with the general objective to do audiovisual videos in first person where they told a preferred story, related to: narrative ability, argument of story and interlocutory aptitude. The applied methodology was qualitative, focused on virtual ethnography, bibliographical revision and analytical reading. As a result, alternative, dynamic and fluid histories were obtained on highly diverse themes, which served to reflect the variability of interests of young people today. Finally, thanks to Booktuber practice, the student was empowered to work independently to be a prosumer of audiovisual contents in the Society of Knowledge, without disassociating from the literacy strategies and necessary learning skills in university education.

THEORETICAL FRAMEWORK

An approximation of Booktube definition

On YouTube, a group of users decided to make reviews, giving appreciations and reflections of the books they read. Unlike the analog format, the audiovisual medium enriches the reading experience and shows gestures, intonation, postures and all those characteristics that in a printed medium cannot be evidences. This community calls itself Booktube and they consider that their practices in the network can get to promote the reading in a considerable way (Dominguez, 2016).

Booktube is an online community that joined people of any age, nationality and language. The movement was initiated in the United States and there are currently representatives of various geographical territories. This practice is spreading in a transdisciplinary way at present, although it is starting from mid-2013 when its presence in Spanish is noticeable (Pacheco Alonso, 2014). The Booktube community is defined by Sorensen and Mara (2013) as a networked knowledge community (NKC) made up by original content-producing users on YouTube. They use their own channels to celebrate or discuss books, generally fictions lectures, dedicated to the adolescent public. In fact, this is a community with many literary channels where the Booktubers share videos relate to reading and books.

This phenomenon has existed for several years in the North America and it has been receiving a significant spread since last year in the Spanish-speaking countries, with an exponential growth. Authors such as Sorensen and Mara (2014) consider this phenomenon as a great opportunity to foment lecture in young people. In the Booktube videos, the book review is the center of conversation, with critiques and opinions largely commented on informal and entertaining language among the young audience. Users create their own content and share it in this social communication channel. As Sorensen and Mara (2013) express “in the Booktubers' discourse is possible to perceive rules, functions, stylistic patterns and hierarchies”. All these features are negotiated within a discernible and definable set of practices.

As Comba, Toledo and Duyos (2012) say, “Booktubers declare themselves fans of writers like J.K. Rowling, John Green and George R.R Martin”. According to these authors, publishers point to Booktubers as referents and trainers of new readers and have begun to include them in their business strategies, linking old and new media. Also, the Booktuber' videos are true transmedia practices where young people do review videos that expand fictional worlds (Comba, Toledo and Duyos, 2012: 8).

Video reviews do not last more than 10 minutes and its particular feature is a dynamic narrative, which includes a natural humor. In fact, these videos are more like a sketch than a formal review. Moreover, Booktubers give quality to audience in each one of their productions, demonstrating skills in the video management and audio editing. Many of these young people declare that their main objective are intended to achieve an open discuss with other users about their same affinities, reading and exchange different opinions. Besides, the Booktuber phenomenon is a clear example of what social network and web 2.0 have achieved in the contemporary society “connecting people with a common interest and allowing the creation of new knowledge, providing information, data, facts and new content that may be useful to other people” (Comba, Toledo and Duyos, 2012).

The Booktube community creates and shares content on the network, connecting people around the world with common interests and the motivation to exchange their personal experiences with others, because these actions have become habitual practices in the society of information (Castells, 1999). In the Booktube community, young people share the same communication space and interact in real time, being creators and consumers, emitters and receivers. This means new forms of knowledge production in a collective way. In consequence, information is intimately linked to the digital natives' generation.

By mean of generating knowledge, a person exercises his freedom and to do it is vital the exchange of information that occurs through communicative processes. In this sense, a human being assumes the mediator role. More than ever, today the individual has the freedom to create knowledge and share it in real time on the net, promoting new data exchanges and new creations from that, in an endless circular process. In other words, information and communication go hand in hand, which implies that the knowledge's generation runs in a parallel way to the same objective. Thus, the communicative act works as mediator of the information act itself. In the case of online communities such as Booktube, where its users have established different kinds of links, there is communication in tis pure state. In addition, we have data and information inside all the communicative process that impels the generation of new knowledge. Here, people share common interests and express or discuss their particular perceptions about a certain topic of discussion (Dominguez, 2016).

This is the real power of a social network like YouTube: confers to a determined user useful skill to be creators, consumer and prosumer at the same time. In all these roles, users can share their own content in real time with thousands of other people. This entire Booktube phenomenon causes great changes in the development of social relations in the present. According to SM (2013), Booktube is the community of young readers between the ages of 15 and 25, who upload videos of literary themes with the main objective of recommending readings. The Booktubers are young people who, motivated by the love of reading, manage literary themes on YouTube. Accordingly, Booktube is a social activity, as Lluch (2014: 19) says:

If we understand reading as a solitary pleasure, it contradicts with the need of adolescents to share their hobbies with others. This is the key to success: its social, public, interactive and global character that allows you to socialize reading, share it with any other teenager anywhere in the world and at any time. This form of reading does not distance them from the group of their peers; on the contrary, it creates new affective bonds and builds new friendships. The social networks makes visible the adolescent reader due to it helps them interact with authors and publishers. As a result, the young readers transform them into opinion leaders.

The Booktube community is based on more communitarian ties than on the centrality of the texts that authors like Ong (1987) attribute to the age of the screens. The practices promoted by Booktubers are cumulative rather than analytical. In fact, their challenges and contests still preserved the agonist element that Ong (1987: 51) attributes to the primary orality:

By keeping knowledge embedded in the human vital world, orality places it within a context of struggle. Proverbs and riddles are not used to store knowledge, but to engage others in verbal and intellectual combat: a sort of proverb or puzzle challenge listeners to overcome it with a more opportune or contradictory one.

In the traditional narrative, a kind of bragging about the personal prowess or angry phrases of rival regularly appear in the confrontations between characters (Ong, 1987: 50). This is the meaning of Booktube's playful practices, where reading becomes a game, a contest, a competition, etc. If YouTube builds Booktubers, what kind of YouTube builds Booktubers? It is clear that this platform works as a constructor of visual cultures and convergence whose practice goes beyond uploading videos and sharing them. It means participants of this online community begin to have influences on other cultural scene areas. In addition, the network platform has a strong social component that is based on certain practices, which build community ownership.

Booktube has become an immensely popular book-related social media platform in recent years; the rise of the Young Adult genre and of social media have been dramatic, and it has created a perfect storm of influences that included the expansion of social media and an audience of young readers hungry for story-driven books (Anderson, 2015). These channels are focused on the young adult genre. Many of these channels have thousands of followers. A Booktuber is a grassroots intermediary, an unofficial party who shapes the flow of messages through their community and may become strong advocates for brands or franchises. Booktube is a community where readers and viewers come together to discuss, recommend and celebrate books (Bergmann, 2017).

When a title is discussed on Booktube, readers place their trust in the opinions of the Booktuber. Inside YouTube, the opportunities for collaboration are vast. Due to this ripe overlap of social media and many publishers have working relationships with Booktubers and have long been using the social media platform to publicize their frontlists and reignite interest in backlist titles (Burgess & Green, 2009). Some tactics of working include sending Advanced Reader Copies (ARCs), collaborating on videos and the unboxing videos real phenomenon, read a vast number of titles, and participate in frequent discussions of these books. In consequence, this community is as a cultural phenomenon where audience that surrounds and loves books (Dredge, 2016).

A Booktube video consists of a person reviewing one or several books, speaking casually to the audience into the camera. This style of video is called vlogging such as a diary-style way of communication provides insight into YouTube as a domain of self-expression, community, and public confession. This attribute makes the Booktube community unique (Dunn, 2015). Booktubers represent just a small sampling of a growing community. Actually, many countries are adapting to this style of book blogging, especially nations in which English is not the official language, because Booktube provides a way communicate with one another during the school year. This style of blogging is interesting and more authors are taking part in this practice. This is a great way to open yourself to a new reading marketplace while also making connections with booklovers from around the globe (Kaufman, 2014).

Booktubers tried to match books from their personal libraries with every continent, drawing attention to the fact that authors tended to be under represented in the average Booktuber's book collections. This led to an ongoing discussion in the community, with members making active attempts to diversify their selections, to educate others on this issue, and to highlight less visible and rarely represented books (Lange, 2014). Booktube builds communities around friendships and collaborations, creating conversations around books. As of late, reading has become livelier and readers have been more eager to interact with each other and create intimate social relationships in the wake of a general rise in social media interaction. The social aspect of Booktube, where connection is formed over a mutual interest in books, is a logical extension of behaviour for young people: they share aspects of their lives naturally on social media, thus sharing reading habits and a passion for books there as well as in accordance to their lifestyle (Strangelove, 2010).

Likewise, being perceived as authentic is the key factor for Booktubers for their attraction to adolescents and young adults. The video format of a person talking to an audience while in their home, often their bedroom, portrays an inherently intimate situation. The videos are typically set up as a casual one-on-one conversation with a friend; even collaborations with two or more creators convey this. These videos naturally come in different levels of set-up, mostly depending on filming location, scripting of a video, a vlogger's styling, camera and lighting equipment, and editing choices (Sweney, 2014).

These in-between chat videos are essential in forming a community, as they let viewers participate in the lives of the Booktubers and give glimpses into their times off-screen. They make the Booktuber seem more human, so to speak, more like an actual friend to meet – quintessentially more relatable and perceived as authentic (Vernallis, 2013). Audience bonds with the on-camera persona of a Booktubers in a sense of closeness that cements an assumption of relationship shared by performer and viewer reader. It is the simplicity and portrayed intimacy of Booktube videos that is so appealing and relatable to the viewers. Besides, the majority of Booktubers are women. Likewise, they appear to be usually in their twenties or late teenage years, close in age to their audience of mainly teenagers, adolescents and young adults (Maughan, 2016).

Although, the frequency depends on a BookTuber's occupation. For example, ability to devote time to video making, it is common to post one new video every week. Generally, Booktubers do not join the ranks of big YouTubers. Instead, there are many small and mid-range Booktube channels with subscriber numbers between 1,000 and 50,000 (Burling, 2017). Booktubers create videos as a hobby while studying or working full-time, with varying levels of professionalism. Furthermore, some creators set up so-called Patreon accounts where fans can give one-time or monthly donations. This is a non-commercial and a far more stable and substantial form of support, independent of fluctuating and low advertisement rates (Scheuerer, 2017).

Booktubers often work together with other video creators in so-called collab (collaboration) videos to present and exchange books and opinions. Often this adds to the dynamic of a video, creating even more of a sense of friends meeting for a bookish chat with the viewers. Collabs cross-reference other members of the Booktube or broader YouTube community to introduce viewers to other channels (Hughes, 2017). Two collaborating creators will usually shoot two videos and direct the viewers to the respective other channel. They can grow their audience, sometimes significantly if one collaborator is particularly popular or established. Collaboration is in general very common among content creators. Popular and established creators collaborate with small channels and amplify them, even when the bigger channel has little to gain from the crossover (Albrecht, 2017).

Various Booktubers themselves have uploaded videos with tips and instructions on how to start and manage one's own Booktube channel. Thus viewers are encouraged to try making videos themselves, honing their own skills and becoming a more visible member of the community. Thus, the viewers of Booktube content are encouraged and enabled to create content themselves, learning a variety of technical and social skills (Nakamura, 2013). Booktube appeals to young people as potentially life-long avid readers and customers. The videos are posted regularly and frequently on a platform, the content is versatile and communicative with its comment section, possibility of video responses and cross-use of other social media such as Twitter. This is a congregation of young people interested in reading (Maughan, 2016).

Booktube's particular nature as a medium influences society and reading culture in a complex way. As a platform, it not only amplifies certain content but also certain perspectives that were traditionally not taken into much consideration in established book reviewing mediums. The participating creators have various forms of capital at their disposal (Dunn, 2015). Booktube phenomenon were identified as publisher, author, and reviewer. The influence of Booktubers is most significant and relevant. The Booktuber community as a versatile, dynamic online reading phenomenon. Booktubers' strengths lie in accumulation of human, social, and symbolic capital: particularly through their skills in video-making and social media, the content creators make themselves valuable as human capital (Scheuerer, 2017).

Through their audience engagement, Booktubers accumulate social capital. Through their reliability, community contributions, and individual expertise they gain symbolic capital. They are close in age to the average adolescent viewer and familiar with the environment of YouTube, which many young people frequent on a daily basis. Booktubers navigate this social space with competence. They have a good understanding of what content their audience and fellow readers expect and want (Dredge, 2016). Booktubers' general lack of economic capital and wish to accrue it is an incentive for collaborations with publishers. In this sense, Booktubers can work as advertisers, reviewers, and booksellers: they build a reputation in their taste, trustworthiness, relatability and authenticity with their audience. Booktubers work with books as a lifestyle, not merely as a hobby or a consumer good (Sweeney, 2014).

Community projects and collective reading are widely popular and strengthen the relationship between and among viewers and Booktubers. For example, members create a space for book to gather, discuss and exchange as a natural extension of the digital native's network. This offers publishers an opportunity to build a relationship with readers that they did not have before. Resembling publishing, Booktube works as a content amplifier. It generates social and economic capital for authors and publishers through additional endorsement and sales of books (Anderson, 2015).

As trusted recommenders, Booktubers can keep backlist titles in demand and draw attention to both newly published and lesser-known material. In their content amplification, they accommodate an international, fast-paced, English-reading young audience. Individually and as a community, they can voice demands of the audience for specific material and make publishers aware of what certain readers want to read (Albrecht, 2017). While some agents in the publishing field, such as established professional book reviewing journalists, view Booktubers with disregard, publishers are beginning to recognize their potential as intermediaries, curators, and influencers. Current collaborations show that Booktube content creators provide notable value to the publishing world (Hughes, 2017).

Booktube has notable effects on society and illustrates certain general trends regarding attitudes towards reading, book purchasing and book reviewing. For one thing, Booktube operates on a social media platform as part of web 2.0 with a relatively low participation threshold. As a result, people can contribute content in video making, this help for amateur video makers and especially amateur book reviewers (Albrecht, 2017). Book reviewing is thus no longer limited to professionals in established positions in the field, nor to their particular selection of books to amplify. Consequently, audiences, whose perspectives, tastes, and criticism have not been paid particular attention in established literary media, seize their own platforms and means of content amplification (Anderson, 2015).

Moreover, the Booktube environment encourages frequent exchange through its interconnectedness and frequent purchasing through its culture of habitual book buying. The relatively easy access as well as expectations and customs of constant acquiring changes the perception of books from cultural objects to commodities. Such changes and developments concern the consumers and producers of books as well as the field of media studies (Dunn, 2015). Booktube is one example of this impact and influence. It exemplifies that online platforms should not be under estimated in their relevance particularly to the generation of digital natives and its attitude towards books as well as reading and consuming habits (Maughan, 2016).

Booktube, a smaller YouTube Networked Knowledge Community within the larger YouTube Networked Knowledge Community, also has identifiable elements that include predictable video types and structured elements. Booktube community can move forward as a community through electronic, RL and hybrid spaces not necessarily because of texts, but through a range of expressive genres. As Jenkins (2006: 27) notes:

Networked Knowledge Community operates fluidly and informed about emotions of its members and new forms of community are still emerging. These new communities are defined through voluntary, temporary, and tactical affiliations, reaffirmed through common intellectual enterprises and emotional investments. These communities are held together through the mutual production and reciprocal exchange of knowledge.

Booktube, a non-institutional learning culture, provides one powerful example of how a Networked Knowledge Community operates through this production and exchange of symbolic meaning and affective engagement rather than the educational currency of professional advancement and positivistic and logocentric accumulation of knowledge (Hughes, 2017).

Booktube as learning lab

Booktubers employ discernible textual patterns, have a shared sense of history, and employ rules and hierarchies. Booktube demonstrates the way that genre helps create community definition and differentiation in a Networked Knowledge Community. Some of the style elements in Booktube narrowcasts are similar to those of beauty broadcasts (such as hauls and giveaways), but it is still a distinct community within YouTube (Dunn, 2015). Booktubers combine book reviews with something resembling a book report. In addition, they filmed from the videographer's home or even bedroom. Outside of the recurring thematic segments and elements, these videos are relatively unscripted, contain summaries of the materials read, may have spoiler alerts, and recommend whether subscribers to a particular channel may want to read the book (Sweeney, 2014).

Booktubers self-identify these narrowcasts by name, segment, and style elements. Moreover, they categorize their videos under people and blogs, which demonstrates how the articulation of their own identity. The self-selection of this category indicates exploration of individual identity with an emphasis on the communal and social nature of the interaction created through these videos. In fact, these channels do not focus on a particular product or institution (Albrecht, 2017).

Booktubers are designed to connect readers with similar interests from around the globe. In fact, there is a purposeful disidentification with commercial categories in the publishing industry, which might instead be classified by (Dunn, 2015): demographic area, literary genres and stage of production. One common element of Booktube narrowcasts includes fanning the pages of the book during a video review. The Booktuber community and the industry who benefits from it exist in a kind of symbiotic relationship of mutual benefit. In this sense, we hope to understand how educational institutions can build advantageous and symbiotic relationships (Maughan, 2016).

Booktube is made up of young people who love to read and who want to share that experience with others who share the same interest. Participation in Booktube is normally connected to an interest in reading. These channels do not usually exceed 1000 to 1500 subscribers. The motivating factors for creating Booktube videos must be connected to something else (Scheuerer, 2017). The sense of community among these channels is built upon larger fan culture. The common focus of reading unites the participants, both the video makers and the subscribers. Usually the books read and reviewed are in the Young Adult genre. Although the community is mostly made up of readers and enthusiasts, it also includes some authors of Young Adult fiction. The shared interest in reading and discussing accessible fiction lies at the heart of this Networked Knowledge Community (Hughes, 2017).

The bundling of authors and readers in a community of intrinsically-motivated fans contradicts much of the ideology surrounding compulsory education, which reinforces that most learning is difficult and should be extrinsically mandated and organized by a central state apparatus. Without this central organization, the sense of community still needs a mechanism to organize how the community runs and reproduces its values. In order to harness the intrinsic motivations into a more coherent effort (Burgess & Green, 2009). Booktube channels are often collaborative. Belonging to one of these collaborative groups can make continuation of a channel much easier, as the conventions and large subscription base can make replacing lost content creators both easier and a part of what it means to be a community member. Starting a channel from scratch can take time to capture and increase views and to encourage people to subscribe (Dunn, 2015).

Becoming part of collaboration can quickly move someone upward in the hierarchy of the social online structure. Moreover, contributors receive more exposure more quickly and they are recognized as an authoritative voice more quickly than they otherwise might have been. Being part of a collaborative channel does not normally limit what an individual contributor can accomplish (Albrecht, 2017). For example, people who are part of these partnership channels often have their own vlog (video blog) channels as well. Contributors to a collaborative channel often promote their vlog channels via annotations on the screen, links in the information box, or discussing it in videos. In this way, subscribers can sometimes carry over fans of the collaborative Booktube channel into the new independent channel, building a base for the contributor's vlog. It can allow the contributor to more easily peel away from the group and rely only on a channel created and run independently by the former collaboration member (Sweney, 2014).

Booktube can trace its birthdate to late 2009. Being able to trace Booktube's inception to its beginning helps to identify as vital history. Booktubers are not simply book bloggers or vloggers: they are a unique community with a shared purpose and beginning. They focus not only on individual interests, but also on the interests of their viewers and the community as a whole through a common story and set of elders and heroes (Dredge, 2016). Booktube channels need the interaction with, and acceptance by, an audience in order to remain vital. These videos contain a component of shared experience that is essential in motivating a channel's continuation. Without the audience participation, channels get buried in searches and the revenue stream from ads and sponsorships dries up (Scheuerer, 2017).

Therefore, the Booktuber must indicate respect for the audience by being responsive to viewers' preferences and needs. Normally, the Booktube content creator is the leader in an exchange, likely because of the perceived popularity. The number of views, comments, and subscribers cues viewers in to the hierarchical standing of the channel. A channel with many subscribers and many views can be identified as one that has high visibility and that likely helps to shape the direction of the community (Nakamura, 2013). Often, viewers will engage in the conversation by responding to statements or questions from the video. This interaction helps build the foundation of community within an individual channel, providing for the channel creator the opportunity to make visible the channel's vibrancy and popularity. In addition, videos, which receive a lot of commentary or which are rated by the viewers will be promoted more through YouTube itself (Hughes, 2017).

Therefore, asking the audience questions or telling them to leave a response or opinion on what was discussed also gives the channel power to promote itself. In this way, Booktube channels display vested interest in the increased success of their channel and its acceptance within the community. In the comments section of videos, viewers may also offer suggestions for future reviews. While these suggestions benefit the channel through increasing the comment count, they also provide ideas for future videos (Maughan, 2016).

In addition, the more times a particular book or author is suggested, the more sure the channel can be that the audience will respond positively to a video on that book or on a book by that author. Viewers whose suggestions are accepted and then acted upon can feel that their opinion matters and that it is helping to shape the channel's content (Scheuerer, 2017). The power that stems from being a contributor in this way—particularly the sense of power felt by a contributor who may be named in the video—is a type of recognition that enfolds the viewer into the community. It is a signal of acceptance that indicates a viewer has become a fully engaged and participatory member of the Booktube community (Burgess & Green, 2009).

Accomplishments tied to channels revolve around numbers of subscribers and views, but for a viewer, recognition within a video and a channel taking action on one of the viewer's recommendations is what signals the accomplishment. Like the guest worker or the tourist in an ethnoscape, the viewer whose suggestion has become adopted becomes an integral part of the mediascape and the Booktube Networked Knowledge Community (NKC) (Anderson, 2015). Recognition is important within NKC. Its shared motivations entails a kind of shared accountability that models the larger goals of academic assessment and certification (Strangelove, 2010):

External accountability in networked communities means being open and transparent to the public about what network members are doing and how well it is working. Strong external accountability systems can also contribute to the achievement of a widely shared sense of purpose, create a sense of urgency, provide pressure' for change, and offer a forum for conversation about the work of schools.

Booktube builds immediately accessible forms of accountability through explicit comments, views, and even sponsorship. The connection between these external accountability affordances and subtle and hierarchical gestures of Booktubers gives students a global view of how online communities operate. Networked Knowledge Community can reconnect students to the larger processes that educational institutions have hidden from novices, and can therefore re-invest students with ownership of learning processes (Hughes, 2017).

Types of videos

Regarding to Dominguez (2016) there are different type of Booktube video such as:

- **Reviews:** In videos of this type, the Booktuber comments a book, from plot and characters until his personal experience about reading. The aim is offer to audience an opinion, not a criticism. In this sense, Booktubers are simple readers, not philologists. Additionally, after the comment of each book, Booktubers give a significant valuation in a scale from one to five. Further, Booktubers often upload a more widely written version of video reviews.
- **Wrap up:** It consists of the brief comment of each reading made over a specific period of time, usually a month. Contrary to happens in reviews, the length of these comments is much shorter. In wrap up, Booktubers focus more on personal opinion than on the objective aspects of the book.
- **Top:** Booktuber does a selection of books according to a specific criterion and each video publication briefly explains reasons why they have been included certain literary works in the group of best readings.
- **Unboxing:** In this type of videos, Booktuber opens, in front of camera, packages of books that arrive at home. These videos plays with the surprise and emotional factor.
- **Book haul:** Also known as IMM Vlog (In My Mailbox) try to show the latest literary acquisitions. In Book haul, these users can make comments related to the multiple expectations placed in appointed books. The most popular Booktubers receive enough books to be able to record their own videos one per month. Usually, these books are offered by publishing houses.
- **Book shelf tour:** Try to show, book-by-book, contents of the shelves, mentioning data like title and author of each publication. Booktuber make very long videos, sometimes, divided in two series. Often, users omit all kind of review's comments.
- **Book tag:** The book tags are games formed by different phrases or words related to a theme that Booktuber should associate with books or characters. An example could be a book tag of social networks, which includes questions related to: twitter (short favorite book), Facebook (a book that many people have recommended) and Instagram: (book with a very beautiful cover). At the end of the video, it is common for Booktubers invite other members of the online community to make the same video. Finally, it is important to note that Booktubers often use this type of videos to collaborate, in mutual benefit, with other colleagues, committing each other to upload a portion of the video in their respective channel. This is a very effective way to gain visibility and new subscribers.
- **Book challenge:** These videos are literary challenges that Booktubers are usually made in the company of other community members. We are in front of a friendly competition in which only one winner can remain. For example, the Infinite Challenge game consists of saying, in a minute, the greatest number of novel titles possible.

- Vlogs: In the world of Youtube, a vlog is a video composed of audio-visual fragments arranged chronologically. For the realization of these videos, Booktuber usually takes camera with him with the main objective of portraying an entire day and his daily routines such as: attendance to literary events; visit a publishing house, etc.

Positive aspects

With respect to the positive repercussion that Booktube generates on young people, it is necessary to emphasize its ability to promote reading. In words of Dominguez (2016), Booktubers describe books very closely, as if they were talking to a friend, and that is why message they transmit comes much more effective, even better than a class of a teacher. Besides, the Spanish Booktuber Fa Orozco declares that her followers are not lovers of readings; however, they have been encouraged to read by the connection that they feel with her, because users experience a certain attraction by her personality and because the idea of a community where members talk about books is newfangled.

Booktube not only favors readings, but also turns it into a social activity, allowing the opinion exchange between members and followers. According to Cordon and Gomez (cited by Rovira-Collado, 2015) the Booktube phenomenon promotes a sort of social or collaborative reading. Social or collaborative reading is developed in virtual platforms, forming a community that encourages diverse forms of exchanges about comments, annotations, evaluations, tags and labels. This emerging reality begins to cross the digital line, being already common meetings between bloggers, Booktubers and simple lovers of readings. Thus, reading promotion, participation and information exchange are so effective inside platform that there are those who already see in the Booktube community various didactic possibilities. This is how Sorensen and Mara points out (2013: 94):

Benefits of incorporating Booktube practices into a literature or writing classroom include the possibility of using videos as a model for their own writing. Encouraging participation in this community also invites students to experience with the literary art within a space where hierarchies are shifting. So, while in a traditional literature classroom teacher is always at the top of the chain, with the Booktube experience students can see reactions of other in front of their work and begin to understand that the external evaluation is based on adherence to share values within generic form and within accepted signifiers of quality. In this way, teacher, rather than being an expert and authority, can become a fellow fan who both loves and understands the new student culture.

METHODOLOGY

The applied methodology was the aulic pedagogy denominated communication-action, which consists in the implementation of the Booktuber theory with 35 undergraduate students of the Social Communication degree at the Technical University of Machala, a higher education institution located in the Ecuadorian coast. The practice was carried out in the academic semester of May-September 2017. The work assignment was to carry out book reviews in audiovisual format. Books were selected for personal preference and affinity of the student himself. The practice of the Booktuber theory sought to qualify the autonomous work of the student in extraclass assignment.

RESULTS

Parts of a Booktuber's video

The Booktube videos generated by 35 college students can be analyzed in two specific parts, which are:

- The first part normally provides a short overview of the book's general plot and it may include reading of the synopsis on the back of the book. This section provides the thrust of the review: is the book suggested for viewers to read. This portion of the video seems aimed toward those who have not read the book, but who are looking for suggestions in whether to, and how to approach the book.
- The second part of the video informs people who have already read the book and who want to see what the reviewer thought about it.

These portions are generally more animated because they can freely discuss content without fearing the same

negative reaction they may get if they gave too much of the plot away in the review. When too much information about the plot of a book is given in the review portion, viewers can become angry (Scheuerer, 2017).

Topics

The next topics are analyzed in the Booktube videos produced by 35 college students:

- Certain topic, specific theme.
- Conventional the seasonally appropriate.
- Genre.
- Reading habits.
- Discuss works of particular current relevance.
- Works short-listed for literary awards.

Values

The following values are transmitted in the Booktube videos made by 35 college students:

- Promotion and discussion of books they love.
- Easily aligns with a publisher's goal of having their books sell.
- Creating an environment ripe for publishers and Booktubers to collaborate.
- Through Booktube, publishers can reach previously untapped communities of readers, create new readers, and access influential communicators that spread information about books.

CONCLUSION

- Booktube can help teachers design assignments. For example, students will be synthesizing information between channels but also between genres. In addition, they will be able to discuss how these videos are different than the traditional reports that they have been asked to do. Moreover, they can determine the difference between review and discussion and the reasons for each. Likewise, can be explored the importance of audience and medium and finally students can use this information to produce their own work (Dunn, 2015).
- Composing using a medium like YouTube can help involve students in their own learning process. In this case, students would apply what they have learned about genre in forming their Booktube videos. They would be concentrating not only on the basics of their book report, or even on the writing of the report, but they would also be synthesizing what they have learned about the genre to create their own contribution (Scheuerer, 2017).
- By introducing Booktube to students, teachers may be able to inspire additional engagement in both the reading and the reports or other assignments that are based on it. For example, the community aspect of Booktube may create a more inviting and social environment into which these students can contextualize their schoolwork. They will be able to write for an authentic non-teacher audience and see a broader reach for their work—and therefore a broader purpose. While assignments can be perceived as busywork or simply a way to prove that they completed the reading, production of a Booktube video contributes to the knowledge base of a far-reaching audience (Strangelove, 2010).
- The work becomes something larger than an exchange between a very limited audience. It gains importance and therefore provides additional motivation or impetuous to produce better work. In addition, negative feedback received from an external audience will likely carry additional weight for the students. While these comments from viewers should be discussed and even refereed, they can point out to students when reviews or summaries are lacking. They can also provide encouraging guidance (Burgess & Green, 2009).
- Booktube community is perfect for the kind of peer review that we want students to engage in as they write, create and revise their work in different media. Feedback from multiple channels can help students to improve their work in a type of peer review that is not standard. Whereas teacher comments might simply be addressed, these types of comments would likely be analyzed, weighed for accuracy—, and perhaps even discounted—before the students address them in a revision (Dredge, 2016)

REFERENCES

- Albrecht, K. (2017). Positioning Booktube in the publishing world: An examination of online book reviewing through the field theory. Leiden University. Retrieved from: <http://bit.ly/2xt8EPZ>
- Anderson, P. (2015). Frankfurt Focus: YouTube, Booktube... PublisherTube? Thought Catalog. Retrieved from: <http://tcat.tc/2feU48c>
- Anderson, M. (2015). 5 facts about online video, for YouTube's 10th birthday. Pew Research Center.
- Bergmann, S. (2017). We Spend a Billion Hours a Day on YouTube, More Than Netflix and Facebook Video Combined. Forbes. Retrieved from: <http://bit.ly/2fva4ja>
- Burling, A. (2015). Book Publishing Comes to YouTube: Publishers Are Mining Huge Fanbases of Bloggers, Vloggers, and YouTube Stars For New Projects. Publishers Weekly, 262(7).
- Burling, A. (2017). Book Publishing Comes to YouTube. Publishers Weekly.
- Castells, M. (1999). La Era de la Información: Economía, Sociedad y Cultura: La sociedad Red. México: Siglo XXI.
- Comba, S., Toledo, E. y Duyos, L. (2012). Algunas consideraciones sobre las prácticas de comunicación, consumo y producción cultural en los nuevos medios en jóvenes rosarinos. Austral Comunicación, 1(1).
- Dominguez, B. (2016). Análisis del fenómeno BookTube en España. Universidad Politécnica de Valencia. Retrieved from: <http://bit.ly/2hsQ7NF>
- Dredge, S. (2016). Why are YouTube Stars so Popular? The Guardian. Retrieved from: <http://bit.ly/2wBpAz>
- Dunn, G. (2015). Get Rich or Die Vlogging: The Sad Economics of Internet Fame. Fusion. Retrieved from: <http://bit.ly/2xgt3Y9>
- Hughes, M. (2017). Booktube and the Formation of the Young Adult Canon. Book Publishing Final Research Paper, 24. Retrieved from: <http://bit.ly/2wpRfbu>
- Jenkins, H. (2006). Convergence culture: Where old and new media collide. New York: NYU Press.
- Kaufman, L. (2014). Chasing Their Star, on YouTube. The New York Times. Retrieved from: <http://nyti.ms/2jDjpVK>
- Lange, P. (2014). Kids on YouTube: Technical Identities and Digital Literacies. Walnut Creek: Left Coast Press.
- Lluch Crespo, G. (2014). De Booktubers o exposiciones orales para presentar una lectura. ¿Cómo lo hacemos? En Gemma Lluch [Blog]. Recuperado de: <http://bit.ly/2wSf5NC>
- Maughan, S. (2016). Bloomsbury Anthology Pairs YA Authors and Booktubers. Publishers Weekly.
- Nakamura, L. (2013). Words with Friends: Socially Networked Reading on Goodreads. PMLA, 128(1), 238-243.
- Ong, W. (1987). Oralidad y escritura. Tecnologías de la palabra. México: Fondo de Cultura Económica.
- Pacheco Alonso, B. G. (2014). Booktube. Una propuesta para el fomento a la lectura. UNAM. Retrieved from: <http://bit.ly/2xyHNzQ>
- Rovira Collado, J. (2015). Redes sociales de lectura: del libro de caras a la LIJ 2.0. Investigaciones Sobre Lectura, 3, 106-122.
- Scheuerer, H. (2017). Booktubing and Starting a Publishing Company with Oftomes Publishing. Writer's Edit.
- SM (2013). Booktubers en Literatura SM [blog]. Retrieved from: <http://bit.ly/2fnzLBM>
- Sorence, K. & Mara, A. (2013). Booktubers as a Networked Knowledge Community. In Emerging Pedagogies in the Networked Knowledge Society. Pennsylvania: IGI Global.
- Strangelove, M. (2010). Watching YouTube: Extraordinary Videos by Ordinary People. Toronto: University of Toronto Press.
- Sweney, M. (2014). Vloggers Must Clearly Tell Fans When They're Getting Paid by Advertisers, ASA Rules. The Guardian. Retrieved from: <http://bit.ly/2fvByW1>
- Vernallis, C. (2013). Unruly Media: YouTube, Music Video, and the New Digital Cinema. New York: Oxford University Press.

The Behaviors Create Innovation on Social Networks in Multimedia Technology of Undergraduates

Sirikan CHAIYASIT

*Department of Multimedia Technology
Rajamangala University of Technology Isan
sikisang@hotmail.com*

ABSTRACT

The purpose of this study was to investigate the relationships between creating innovation on social network of students in multimedia technology. The participants are the undergraduate students in the second semester of the 2016 academic year in Multimedia Technology, faculty of Arts and Industrial Design at Rajamangala University of Technology Isan in Thailand. The samples of participants used the tables of Confession and Morgan (1970) at 95% confidence level. The 108 participants were selected by specific accidental sampling and used links to the online form. The research tool was a questionnaire for innovative behavior on social networks of multimedia technology in undergraduates. The research has developed 2 parts: 1) To study the basics of using social networks, 2) To study the relationships between creating innovation on social networks.

The results of the first part showed that undergraduates used YouTube for creating innovation the most as it accounted for 80.30 percent, with the aim of using social networks to follow news, and current social issues. The majority of undergraduates believe that social networks have many options and are modern. The second part can be concluded that the relationships between creating innovation on social network of students in multimedia technology: 1) Use social networking to explore opportunities including the behaviors of valuing social networking opportunities, seeking opportunities for innovation on social networks, and gathering information to bring opportunities for innovation through social networking. 2) Use social networking to create new ideas or approaches. And 3) Creating innovation on social network had relationships with basic usage on social network of students in multimedia technology.

KeyWords: behaviors, create, innovation, social networks

Background Motivation

Creativity is the quality that exists in human. If supported, developed, and used properly, it will be very useful. If the populations have high creative, it will be a driving for the rapid development of society. Developing creative thinkers is therefore a great goal. (Areephan Mani, 2015) As well as Multimedia Technology is one of the fields of Rajamangala University of Technology Isan in Thailand where the course is taught to create an innovation and for developing every media.(Multimedia Technology, 2016) But, students can't create a good and effective media. So, I would like to think of a way to help students develop creativity quickly, so they can use in society. And then, currently in Thailand, there is support for the development of education into Thailand Education 4.0 change from listening (1.0), search (2.0), and analysis (3.0) to develop innovation (4.0) (Paitoon Sinararat, 2017); which corresponds to the objective of Multimedia Technology. That is focus make students as creating of developing media and innovation to benefit society and create a new interesting media to everyone. And, the discovery is the statistics online social networks that are becoming popular around the world. According to surveys by We Are Social, the agency for social media research in 2017, Global Social Media Usage: The number of Social Media users now exceeds 2.7 billion, or 37% of the global population. And social media that people around the world used the most is Facebook, active users about 1.87 billion per month. The United States is most active countries 214 million people, and Bangkok, Thailand is the most cities Facebook where 24 million people. (We Are Social, 2017)

From the background and motivations, I'm interested in the study that the behaviors create innovation on social networks in multimedia technology of undergraduates. As the results, it can be used to tools for teaching and learning to manage appropriate for students. Then, apply the results to develop instructional model as the next step.

Objective Of The Study

Study was to investigate the relationships between creating innovation on social network with basic usage on social network of students in multimedia technology.

METHOD

Participants

The students of Multimedia Technology, faculty of Arts and Industrial Design at Rajamangala University of Technology Isan, Thailand in the second semester of the 2016 academic year 150 person. And the samples of participants 108 used the tables of Morgan (1970) at 95% confidence level, selected by specific accidental sampling and used links to the online form.

Hypothesis of the research

H0: The relationships between the creating innovations on social network with basic usage behaviors on social network.

H1: The relationships between the creating innovations on social network with basic usage behaviors on social network are not related.

Variables of the research

The variables of the research have used 2 variables as showing in the table:

Table 1. Variables of the research

Basic usage behaviors	Innovation behaviors created
Social networking experiences	Problem recognition behavior
Social networking channels	New idea behavior
Types of social networks	Opportunity exploration behavior
Purpose of social networking	Creativity behavior
Reasons of used social networking	Formative investigation behavior
	Leadership behavior
	Application behavior

The Research Tools

The research tools were a questionnaire links to the online form and develop 2 parts:

- 1) Basic usage behaviors on social network (We Are Social, 2017)
- 2) Innovation behaviors created on social network (Bruner, L. S., 1969, Kleysen and Street, 2001, Eric Jensen, 2000, Guilford, J.P., 1967, and De Jong, J. P. J., 2007)



Figure1. The research tools were a questionnaire links to the online form

Analysis Of Data

- 1) Find out the mean and percentage of basic usage behaviors on social networks.
- 2) Find out the chi-square of Pearson for each relationship by crosstab method to find out the hypothesis set.

RESULTS

This research was a survey research to study about the investigation of the relationships between creating innovation on social network with basic usage on social network of students in multimedia technology. And showing the results are there descriptive analysis consists of frequency, percentage, mean, and standard deviation. The results have divided into two parts follow as:

Chapter 1: Basic usage behaviors on social network as follows

1) Social networking experience

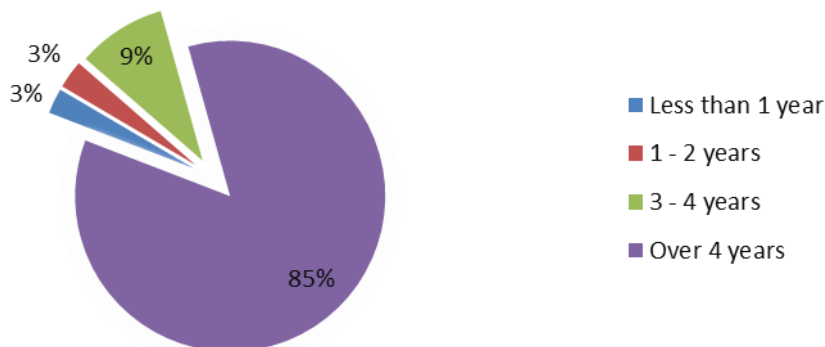


Figure2. The results of social networking experience

From the figure 2 shows that the experience of a sample group in the undergraduate; 85 percent of them have the experience to use the social networks more than 4 years, 9 percent are using the social networks about 3-4 years, and 3 percent are showing the number of a sample group who are having the experience to use a social network for 1-2 years and less than 1 year.

2) Social networking channels

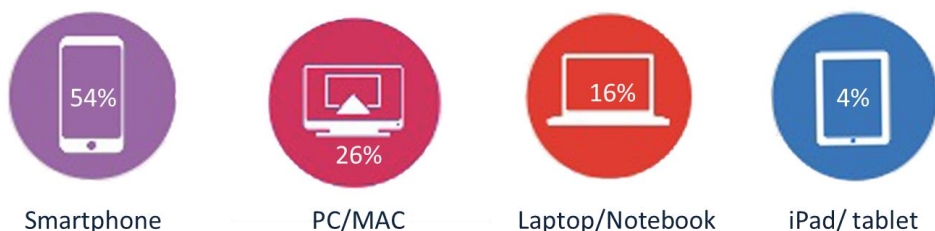


Figure3. The results of social networking channels

From the figure 3 shows, the channels that using for social networks are almost use through a smartphone there are 54 percent, 26 percent are using PC and MAC, 16 percent are using laptop and notebook, and 4 percent of a sample group are using i-Pad and tablet.

3) Types of social networks

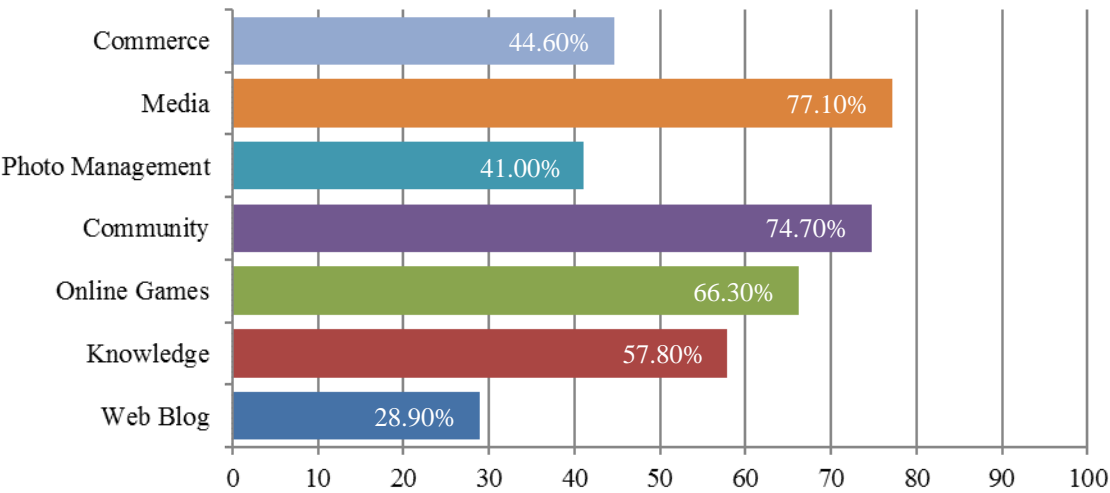


Figure4. The results of types of social networks

From figure 4 is the results of types of social networks, we can conclude that the people of a sample group; 1) 77.10 percent of them are almost used a media (e.g. YouTube is the media that most people also use in their life), 2) 74.70 percent are using community (e.g. Facebook is the media that most people also use in community), 3) 66.30 percent are using online games, 4) 57.80 percent are using data and knowledge (e.g. Wikipedia is the media that most people also use in data and knowledge), 5) 44.60 percent are using business and commerce (e.g. Amazon is the media that most people also use in business and commerce), 6) 41.00 percent are using photo management (e.g. Instagram is the media that most people also use in photo management) and 7) 28.90 percent are using web blog (e.g. Pantip is the media that most people also use in web blog).

4) Purpose of social networking

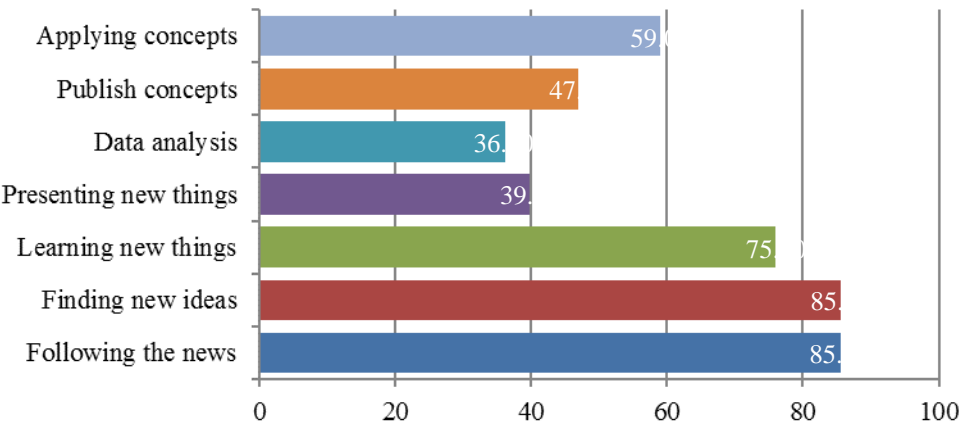


Figure5. The results of purpose of social networking

From the figure 5, the results of purpose of social networking, shows that the objective that people use through the social networks are; 1) 85.50 percent are using of them following the news and finding new ideas, 2) 75.90 percent are using of learning new things or ideas, and 3) 59.00 percent are using of applying concepts for create their work.

5) Reason of used social networking

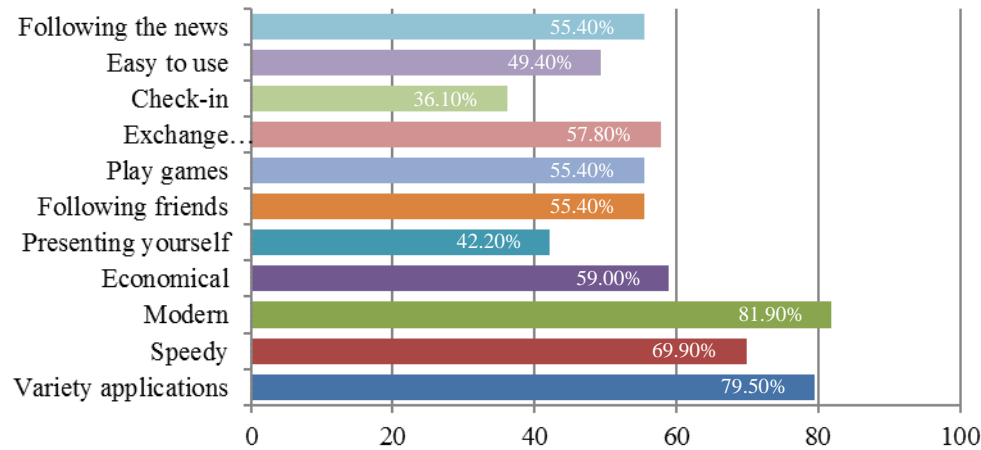


Figure6. The results of reason of used social networking

Form figure 6, the results of reason of used social networking shows, 1) 81.90 thought there are modern, 2) 79.50 percent of them are having several of application, and 3) 69.90 percent of them thought that they can receive data faster through the social networks.

Chapter 2: Innovation behaviors created on social networks as follows

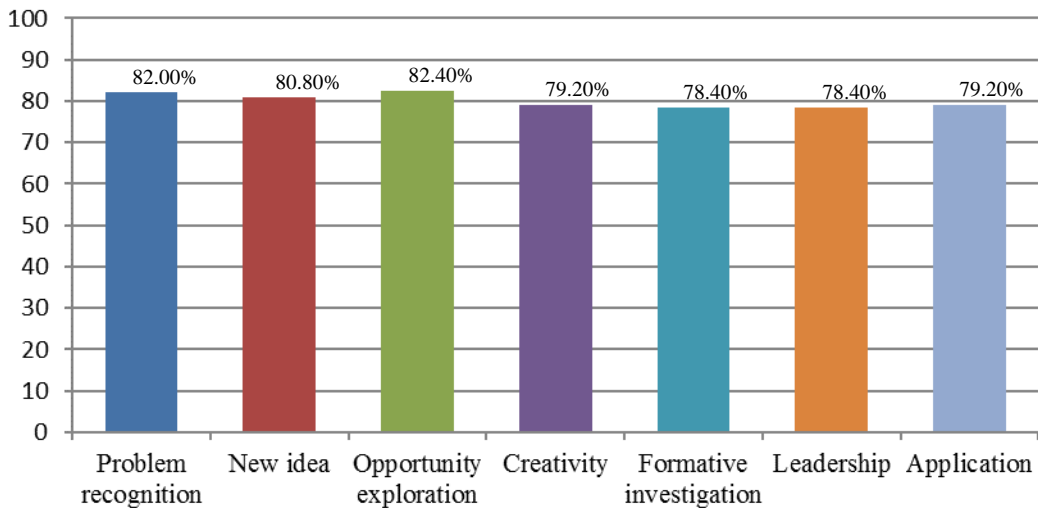


Figure7. The results of innovation behaviors created on social networks

From figure 7, the results of innovation behaviors created on social networks, shows that a sample group are using the innovation behaviors created on social networks for; 1) Opportunity exploration about 82.40 percent, 2) Problem recognition about 82.00 percent, and 3) New idea about 80.80 percent.

CONCLUSION

Table2. The relationships between the creating innovations on social network with basic usage behaviors on social network

Innovation behaviors created on social networks	Basic usage on social networks				
	experiences	channels	Types	Purpose	Reasons
Problem recognition	*	*	-	-	-
New idea	*	-	-	-	-
Opportunity exploration	*	*	*	-	-
Creativity	*	*	-	-	-
Formative investigation	*	*	-	-	-
Leadership	*	*	-	-	-
Application	-	-	-	-	-

Note:

* (star): It was statistics significant relationship at .05 levels.

- (Dash): It was not statistics relationship.

- 1) Social networking experiences had relationships with creating innovation on social network namely problem recognition, new idea, opportunity exploration, creativity, formative investigation and leadership.
- 2) Social networking channels had relationships with creating innovation on social network namely problem recognition, opportunity exploration, creativity, formative investigation and leadership.
- 3) Types of social networks had relationships with creating innovation on social network namely opportunity exploration.

REFERENCES

- Aree Phanmanee. (2015). Practice to think & Creative Thinking. Bangkok: The Printing Office of Chulalongkorn University
- Bruner, L. S. (1969). The Process of Education. Massachusetts Haward University Press Cambridge.
- De Jong, J. P. J. (2007). "Individual Innovation: The connection between Leadership and Employee Innovative Work Behavior". <http://ideas.repec.org/p/eim/papers/r200604.html>, March-19-2017
- Eric Jensen. (2000). Brain-based learning: the new science of teaching & training. San Diego, CA: The Brain Store.
- Guilford, J.P. (1967). The Nature of Human Intelligence. New York: McGraw-Hill.
- Krejcie, R. V. & Morgan, D. W. (1970). Determining Sample Size for Research Activities. Educational and Psychological Measurement
- Multimedia Technology. (2016). Graduate Courses. Nakhon Ratchasima: Rajamangala University of Technology Isan
- Robert F. Kleysen, Christopher T. Street. (2001). Toward a multi-dimensional measure of individual innovative behavior, Journal of Intellectual Capital, Vol. 2 Issue: 3, pp.284-296, <https://doi.org/10.1108/EUM0000000005660>, March-19-2017
- Paitoon Sinararat (2017) Thai education 4.0 is more than education. Bangkok: College of Education Dhurakij Pundit University. <http://www.dpu.ac.th/ces/upload/content/files.pdf>, March-19-2017
- Prachyanun, N. and Panita, W. (2013). Managing blended learning: a blend ratio. The Journal of Developing educational year at No. 25 85 January-March, 2013.
- Scott, W. A. (1967). Introduction to Phychology Research. New York: Wiley and Son, Inc.
- We Are Social. (2017). the statistics online social networks are becoming popular around the world. <http://www.frustrationfreeit.com/images/Social-Networking-Social-Media-For-Business.png>, May-20-2017

The Development of Interactive Multimedia Learning Pyramid and Prism for Junior High School Using Macromedia Authorware

Juhriyansyah DALLE

*Department of Information Technology,
University of Lambung Mangkurat,
Jl. Brigjen H. Hasan Basry, Banjarmasin 70124, Indonesia,
j.dalle@unlam.ac.id*

Sutarto HADI

*Department of Mathematics Education,
University of Lambung Mangkurat,
Jl. Brigjen H. Hasan Basry, Banjarmasin 70124, Indonesia,
shadiunlam@gmail.com*

Baharuddin

*Department of Electrical Engineering Education,
State University of Medan,
Jalan Willem Iskandar Pasar V Medan 20221, Indonesia
dr.baharuddin@gmail.com*

Nurlaila HAYATI

*Alumni of Mathematics Education Department,
State Islamic University of Antasari, Banjarmasin, Indonesia
nurlailahayati39@gmail.com*

ABSTRACT

Limited access to information due to the unavailability of internet connection in remote areas of Indonesia, especially in South Kalimantan, causes low mathematics achievement of students in junior high school, so still, require offline packages of learning such as interactive multimedia learning, therefore this study aims to develop interactive multimedia learning of pyramid and prism. The research was applied Luther (1994) method that consists of six steps: concept, design, collecting material, assembly, testing, and distribution, and for the development was using Macromedia Authorware. The result is an interactive multimedia learning pyramid and prism with following the description of the steps of developments.

Keywords: interactive multimedia pyramid and prism, mathematics achievement.

INTRODUCTION

The current globalization era, the development of science and technology is growing rapidly which effects of the progress or the decline of a nation. The progress can be realized in life if human resources having the ability of science and technology in any various fields. Therefore, various ways related to the improvement of the quality of human resources, especially through education. Education can be interpreted as a process of training and teaching for individuals to achieve knowledge, understanding, skills development and behavioral ways that suit their needs. Moreover, education also is a very important factor in improving human quality.

Various efforts have been made by education managers to develop education in order to improve student learning achievement by optimizing the available educational resources. One of the goals of today's education is to provide stock so that we can function effectively in this era of technology.

Mathematics as the science underlying the development of modern technology has an important role in various disciplines and advances the human mind.

In fact, mathematics is indeed considered the most difficult lesson for both children and adults (Reynolds, 2008). In Indonesia, this can be seen from the survey that conducted by Trends in International Mathematics and Science Study and by Organization for Economic Co-operation and Development by using PISA instrument, showed that the achievement of Indonesian student on mathematics are still low with ranking 45 and 69 from 55 and 65 countries (Mullis et al., 2015; OECD, 2017).

The successful of mathematics learning process during this time is still experiencing many obstacles because of the dominance of teachers in learning is still high, the lack of use of media and props (Fitriah, 2011). In the delivery of learning, teachers pay less attention to the use of learning media to help students understand the concept of mathematics (Anggraeni, 2012).

Mathematics consists of four aspects: algebra, arithmetic, geometry, and analysis. Geometry has been taught since elementary school, but it turns out students' ability in solving three-dimensional problems are still low (Fitriana, 2010). In fact, this material is very important to learn the next material on a higher level of education.

In the three-dimensional learning process, teachers typically use three-dimensional learning media that has been provided in schools such as props pyramid and prism made of wood or other concrete objects. However, not many teachers utilize existing technology in delivering learning materials whereas today's technology has contributed greatly to providing educational media in education.

Information and Communication Technology (ICT) has spread to almost every aspect including the world of education (Neo & Neo, 2014). One technology that developed in the world of education is multimedia technology which has a very important role in the learning process (Mumpuni, 2013). It is expected that multimedia can bring a positive impact on classroom learning that can bring learning into an active, fun and effective and can overcome the problems that we have often encountered in the world of education, especially mathematics subjects.

Multimedia is a way to produce and deliver learning materials by combining several types of computer-controlled media where the interactive multimedia program is one of computer-based learning media that combines and synergizes all media consisting of text, graphics, photos, videos, animations, music, narration and interactivity programmed by theory and principles of learning (Warsita, 2008).

One of the computer programs that support for making interactive multimedia learning is Macromedia Authorware. Macromedia Authorware is a multimedia software that integrates with global network internet with graphical display sound, digital movie, video and interaction buttons that can generate its own attraction (Adjarriawan, 2011).

Limited access to information due to the unavailability of internet connection in remote areas of Indonesia, especially in South Kalimantan and regarding to the background, it is important for researchers to contribute in providing an interactive multimedia learning, especially for the pyramid and prism material which created by using Macromedia Authorware.

LITERATURE REVIEW

Multimedia Learning

Multimedia learning is a multimedia application used in the learning process, in other words, to channel the message (knowledge, skills, and attitudes) and can stimulate thoughts, feelings, attention and willingness to learn so intentionally the learning process occurs, aimed and controlled (Ariani & Haryanto, 2010). While the interactive multimedia is a multimedia display designed by the designer so that it can meet the function of informing the message and has interactivity to its users (Munir, 2012).

Multimedia interactive learning has its own characteristics such as having more than one convergent media (can combine audio and visual elements), interactive, has the ability to accommodate user responses, is self-contained, provides convenience and completeness of the content so that users can use without the guidance of others.

In addition, interactive multimedia learning should meet the following functions: be able to strengthen user response as quickly and often as possible; able to provide opportunities for learners to control their own pace of learning; notice that learners follow a coherent and controlled sequence; and able to provide opportunities for participation of users in the form of responses, either in the form of answers, selection, decisions, experiments, and others. The interactive multimedia learning capabilities of interactive multimedia have several capabilities not shared by other media; multimedia provides an interactive process and provides ease of feedback, giving multimedia freedom to learners in determining the topic of the learning process, giving multimedia ease of systematic control in the learning process (Lee, 1999).

The benefits that can be gained from the interactive multimedia learning is the learning process is clearly more interesting, more interactive, the amount of teaching time (lectures) can be reduced, the quality of student learning can be more motivated and boosted and learning can be done anywhere and anytime (very flexible), as well as student attitudes and attention can be improved and centered (Ariani & Haryanto, 2010).

Text Design and Multimedia Learning Layout

The text is a learning multimedia component that is very important in delivering a learning message. For that the use of text in the development of multimedia applications need to pay attention to the way or technique that is the use of concise but solid text, use the appropriate typeface and font, make sure the text can be read, the selection of writing style and text color and the selection of fonts and concepts consistently (Munir, 2012).

Some considerations of text design in multimedia view, among others (Marzuki, 2009):

- a. Consider formatting, a text designed for easy reading.
- b. Text design is a visual hierarchy; people tend to read the largest element, then the smallest.
- c. The text arrangement should improve readability.
- d. All factors of letter spacing, word spacing, and line spacing are easy to read, communicative and expressive.
- e. Consider using letters, use original characters, and think about positive/negative spaces.
- f. When mixing the text surface, it must be ethnically adapted to the message, contrast, weight, scale and visual hierarchy.
- g. Avoid anything new or decorative typeface.

Munir (2012) explains that to create text in the development of multimedia products there are several ways that can be used include:

- a. Be careful in choosing the appropriate font type so that the display on the computer screen is not hard to read.
- b. Use of large number faces of font type on one screen should be minimized.
- c. Spacing the characters, lines, and spacing between text and text with other objects such as images.
- d. Use text of any size, type, thickness, and so on to deliver messages to attract more users and should use larger text and bold fonts.
- e. Use white text if the background is black or dark and avoid using the same color or color mix that resembles the background color.

In addition to text, another thing to note is the layout (layout) multimedia. Layout (layout) is the placement of text, images, audio, video, and animation as a multimedia display of learning (Marzuki, 2009). The placement of multimedia elements greatly affects messages or information visualized because of improper placements the impression is unattractive; otherwise, the perfect placement will give the impression that multimedia display is interesting (Marzuki, 2009).

Implementation of all layers visualized with the same concept (not exactly execution), in the design of visual communication this is called unity, which uses the audio and visual language harmonious, intact and matching so that the teaching materials are perceived as intact (Marzuki, 2009).

To help the execution of layout can be made grid system, that is division of field according to ergonomic element functions, for example laying of navigation adjusted with mean of command of navigation, navigation 'next' placed on the right and 'back' placed on the left and so forth (Marzuki, 2009).

Preparation of the text is consistently left, right, or symmetrical depending on the desired concept, but the left flat layout tends to give the impression of informal and flowing, left-right average more formal and rigid impression, and symmetrical memorable very formal and the layout is made more for the purpose of adding value to the communicative aspects of multimedia learning, not for beauty alone (Marzuki, 2009).

As a first step, you should create a simple layout, so that visualization is not complicated to reduce noise on the clarity of the content of teaching materials and also intended for the subject matter easy to remember and the layout is expected to meet the aesthetic rules, among others: the composition is maintained and produces rhythm, balance, and controlled harmony. Keeping the simplicity can be done by choosing the right graphics layout, minimal and matching according to the character of information and pay attention to the closeness of the layout to the characters/habits of the target or the tastes of students who are in most of the young dynamic spirited and in preparing the layout of the multimedia display of learning need to consider the principles of balance, contrast, harmony, proximity, and repetition (Marzuki, 2009).

Macromedia Authorware

Authorware is multimedia software that integrates with global internet network with graphical display of sound, digital movie, video and interaction buttons that can generate its own attraction (Adjarriawan, 2011). Authorware is used to create interactive programs that integrate various multimedia content (Wikipedia, 2012). Currently, Authorware 7.0 has two choices of programming languages namely Authorware programming languages and JavaScript language version 1.5. The use of icons and the flow line under which Authorware is operated makes it easy to create interesting tutorial applications. The use of a flow line differentiates Authorware from other authoring programs, such as Adobe Flash and Adobe Director that rely on visual timelines and action scripts

RESEARCH METHODOLOGY

This research was applying Luther (1994) method which then modified by Sutopo (2009) into six stages: concept, design, collecting material, assembly, testing, and distribution as explained below:

1) *Concept*

Stage of concept making is the initial stage in making multimedia-based learning media. What is done in this concept stage is the determination of the purpose of the use of instructional media, determining who can use this learning media and analyze the extent to which the material will be applied in this multimedia learning.

2) *Design*

In the design stage, is to specify in detail about the structure of media, style, and material needed. In this design phase begins by arranging the order of presentation and arranging the flow of learning flowchart. This is done in order to make multimedia learning more focused.

The steps of design include: writing the script material that will be made as a multimedia learning, composing the contents of the outline in the media learning, storyboard making, arranging the flow of learning in the form of a flowchart, and the design of learning media layout. The design of media layout done with the help of some image editor such as Adobe Photoshop 7.0 and Paint.

3) *Material collecting*

This stage is the stage of collecting materials and also the advanced stage of the design stage.

The sequence in the process of collecting materials includes the collection of materials needed for multimedia learning such as animation, music, video, and images. For animation and video creation, researchers use some supporting software such as Macromedia Flash MX, Macromedia Flash 8, Swish Max 4.0, Adobe Flash CS4, and Anim FX and development of test questions (Competency Test) which further compilation of test instruments pay attention to several things, referring to education unit level curriculum, assessments viewed from the cognitive aspect, the items are multiple choice items.

4) *Assembly*

Assembly is the stage where all multimedia objects are created or inserted into each frame called screen mapping. The steps taken in the manufacture of the media begin by integrating all the material that has been made into the layout according to the storyboard and transfer all the components that have been made into the screen mapping by using flow line on the Macromedia Authorware program.

5) *Testing*

Stage testing is done by running the application for errors tracer for application improvement (Sutopo, 2009). In this study, testing is done by using black box testing for testing some functions that were wrong or missing, interface design, or other performance errors.

Black box testing is to see whether all the device functions are running properly according to the defined functional requirements (Pressman & Maxim, 2014). Black box testing is done to 2 teachers of mathematics subjects and 72 students of grade VIII of Madrasah Tsanawiyah Hidayatullah Banjarmasin South Kalimantan Indonesia. Black box testing focuses on Interactive Learning Multimedia error searching. Black box testing performed on testing system functionality including buttons, interface design, animation and material that is displayed is in accordance with the standard GUI (Graphical User Interface) that allows users to interact with the computer. If all the buttons on the Interactive Learning Multimedia being tested can run as expected then this interactive multimedia learning can be said to fulfill the GUI.

6) *Distribution*

In the Luther method, this stage is the stage of distribution or stage of program sales. However, in the Luther-Sutopo method (Sutopo, 2009), this stage is modified into a multimedia distribution or packing stage into a storage medium. In this research, storage media is CD.

Multimedia packaging is done after this interactive multimedia learning is published in the form of .exe for subsequent burning into CD.

RESULTS AND DISCUSSION

Developing interactive multimedia learning of pyramid and prism material for VIII grade the 2nd grade of Junior high school is done with multimedia development procedure. The design of this research is done through six stages: the concept of concept, design, collecting material, assembly, testing, and distribution (Luther, 1994).

The researcher's concepts include determining the purpose of using instructional media, determining the objectives in making instructional media, analyzing the extent to which the material will be applied, and determining the competence standard, basic competence and the material indicator that will be applied in this learning multimedia. From the results of material analysis obtained two sub-materials that will be delivered in this interactive learning multimedia that is pyramid and prism. Each sub-material is divided into 4 parts namely understanding, painting, surface area, and volume.

The results of research on the design of interactive multimedia learning include narrative script, storyboard, flowchart and layout of learning media. Based on the script written then this interactive learning CD is divided into three parts, namely:

- 1) The initial (preliminary) section consists of intros and preliminary menus.
- 2) The core consists of several parts of the menu are figures, menu materials, competency test menu, glossary menu, and menu list of libraries, and profiles of researchers.

- 3) The cover contains an exit menu. As for designing layout of this interactive learning CD, the researcher uses adobe Photoshop 7.0 software. This application is used for processing images that will be imported into Macromedia Authorware to be used as background, buttons, and text that will be used in this learning CD also made using adobe Photoshop. Here are the layout design results:



Capture 1. Background Main Page



Capture 2. Design of information on interactive multimedia learning CD package



Capture 3. Samples of buttons and their response

At the collecting material stage, the collection of video, animation, instrumental music and the results of the development of test instruments that have been tested and then will be applied to interactive multimedia learning.

A testing instrument that tested there is two packages questions that are a package of questions A and a packages questions B, each package consisting of 30 multiple choice questions which then analyzed the validity, reliability, difficulty level, and discrimination.

At the assembly stage, media creation is done gradually. Making learning media applications based on the storyboard, flowchart view, navigation structure or object diagram comes from the design stage. These interactive learning multimedia is created using Macromedia Authorware 7.0 as the main software.

Making interactive multimedia learning in Macromedia Authorware 7.0 using a flow line system that can facilitate the process of importing animations, music, videos, exercise questions, navigation systems and so forth into the work area Macromedia Authorware 7.0.

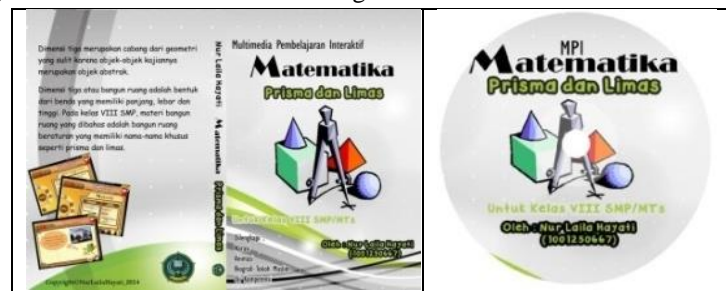
Macromedia Authorware 7.0 also cannot be separated from the programming language used to run program commands. The existing programming languages in Macromedia Authorware 7.0 are Authorware and JavaScript. In this case, researchers use an Authorware language that can facilitate the creation of programming commands. A programming language is used when making the contents of the menu "competency test" in which there is a process of giving time to do problems and the process of scoring and used on the menu "out" to give commands to the program to end the interactive multimedia learning applications.

Each page in this interactive multimedia learning consists of title text animation, text animation and provided a navigation button that links one page to other pages like next to next page, back to page previous and buttons to the main page.

Black box testing results performed on testing system functionality including interface design, animation, and material that is displayed is in accordance with the standard graphical user interface (GUI) so as to facilitate the user in interacting with the computer.

Based on the results of black box testing, it can be concluded that the standard GUI all the buttons can function in accordance with the order that has been designed.

After testing, the next process is to save the file in the form *.exe then packaged in the form of CD learning that is run by using CD-ROM. Here is the label design and cover CD-ROM.



Capture 4. Label and cover design of interactive multimedia learning CD package

In general, developed multimedia focuses on the activities of students in using it; therefore this learning media contains problems related to pyramid and prism material. For that, interactive multimedia learning is ready for use by teachers and students.

Before students or teachers using this interactive multimedia learning CD, at the first they have to know the computer specifications that support to run this program and how to use it. This application has a capacity of 98.3 MB and the minimum requirement to run this interactive CD is Intel Pentium II or more computers with 32 MB memory, 120 MB free hard drive capacity, Windows operating system, 800x600 resolution (SVGA) and a CD ROM drive.

This interactive multimedia learning CD is very easy to use because the program comes with a help menu and instructions that appear each time the cursor is directed to a button that is either icon or text. To enter into this interactive learning multimedia program, simply select this program insert the CD ROM folder, then press enter or double-click.

Conclusion and Recommendation

Making interactive multimedia learning using Macromedia Authorware on pyramid and prism material is done in six stages: concept, design, collecting material, assembly, testing, and distribution. In the concept stage, the objective is determined that this research produces an interactive multimedia learning product in the form of learning CD prism and pyramid of class VIII which can be used by teachers and students as learning media of pyramid and prism.

In the design stage, the results obtained are manuscript produced in the form of analysis of pyramid and prism material, storyboard produced in the form of detailed explanation for each interactive multimedia learning view, the flowchart in the form of the whole learning path in instructional media, and interactive multimedia learning layout design. In the material collecting stage, the results obtained are collecting materials of pyramid and prism which will be displayed in the media in the form of animation, image, video, and music. While at the stage of assembly, all the materials that have been collected processed using Macromedia Authorware program and media results include nine main menus that are The preliminary menu, character, material, competency test, glossary, bibliography, help, profile, and exit.

At the testing, the stage is done by black box method stating that all the buttons can function in accordance with the order that has been designed. The distribution stage is done by packaging process of interactive multimedia learning of pyramid and prism into the form of learning CD.

In the next research is expected to develop an integrated interactive multimedia learning with the model and equipped with games that match the material being taught. Multimedia interactive learning is basically an early development, to furthermore is expected to be tested to the user (student or teacher) to obtain an input to improve the interactive multimedia learning.

REFERENCES

- Adjarriawan, R. (2011). *Interactive multimedia module using macromedia authorware*. Martapura: SMKN 1 Martapura.
- Anggraeni, R. R. W. P. (2012). *Development of multimedia web-based e-learning development courses on the education technology undergraduate Universitas Negeri Yogyakarta*. Master thesis, Universitas Negeri Yogyakarta. Retrieved September 26, 2017, from <http://eprints.uny.ac.id/8391/>
- Ariani, N., & Haryanto, D. (2010). *Multimedia learning at school*. Jakarta: Prestasi Pustaka.
- Fitriana, L. (2010). *Influence of cooperative learning model type group investigation and stad on mathematics learning achievement in terms of student learning independence*. Surakarta: Digital Library Universitas Sebelas Maret.
- Fitriah, A. (2011). *Comparison of combinations of bamboo dance techniques and multimedia animation with bamboo dance techniques without multimedia animation on generic science skills in students*. Retrieved September 2, 2017, from <http://digilab.unila.ac.id>
- Lee, S. H. (1999). Usability testing for developing effective interactive multimedia software: Concepts, dimensions, and procedures. *Journal of Educational Technology & Society*, 2(2). Retrieved from <http://www.jstor.org/stable/jeductechsoci.2.2.4>
- Luther, A. C. (1994). *Authoring interactive multimedia*, AP Professional, Cambridge, MA
- Marzuki, R. (2009). *Multimedia learning evaluation techniques (text design and multimedia learning layout)*. Jakarta: Genius Prima Media.
- Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M. (2015). *TIMSS 2015 International results in mathematics*. Retrieved September, 26, 2017. from <https://timssandpirls.bc.edu/>
- Mumpuni, R. H. (2013). *Development of learning media of social arithmetic based on edutainment to facilitate the creation of active, joyfull, effective learning (AJEL) of students at junior high school seventh grade*. Yogyakarta: Digital Library UIN Sunan Kalijaga.
- Munir. (2012). *Multimedia concepts & applications in education*. Bandung: Alfabeta.
- Neo, M., & Neo, T-K. (2010). Students' perceptions in developing a multimedia project within a constructivist learning environment: A Malaysian experience. *The Turkish Online Journal of Educational Technology (TOJET)*, 9(1). 176-184.
- OECD. (2017). *Education at a Glance 2017*. Retrived September, 26, 2017 from <http://www.oecd.org>
- Pressman, R. S., & Maxim, B. (2014). *Software engineering: A practitioner's approach*. 8th edition. McGraw-Hill Education
- Reynolds, D. M. (2008). *Effective teaching*. Yogyakarta: Pustaka Pelajar.

- Sutopo, H. (2009). *Development of learning model of making multimedia application especially puzzle game in multimedia course*. Jakarta, Indonesia: Digital Library Program Pascasarjana Universitas Negeri Jakarta.
- Warsita, B. (2008). *Learning technology, grounding and its application*. Jakarta: Rineka Cipta.
- Wikipedia. (2012). *Adobe authorware*. Retrieved September 17, 2017, from https://en.wikipedia.org/wiki/Adobe_Authorware

The Educational Qualification of Social Media: A Search for a New Public Sphere*

Ayhan DOLUNAY

*Near East University, Legal Advisor and Lecturer of
Faculty of Communication, Nicosia, TRNC.
ayhan.dolunay@neu.edu.tr*

Çağdaş ÖĞÜÇ

*Near East University, Graduate School of Social Sciences,
Student of Media and Communication Studies PHD Program,
Nicosia TRNC. cagdas.oguc@neu.edu.tr*

Fevzi KASAP

*Near East University, Head of Faculty of Communication
Radio TV and Cinema Department,
Nicosia, TRNC. fevzi.kasap@neu.edu.tr*

ABSTRACT

The concept of "New Media" is a concept that was introduced by social, psychological, economic political and cultural researchers in the field of information and communication based research approximately four decades ago (in the 1970s). However, the meaning of the concept changed and developed in the 1990's with the momentum of the digital age and Internet technologies. By the 2000's, with the establishment of social media platforms, it was observed that interpersonal communication was conducted on this indispensable new medium. Although the communication throughout Social Media platforms is primarily based on entertainment, some communal and global issues are debated on these platforms as well. This characteristic of the Social Media is discussed as it could be regarded as the current rendition of Habermas's "Public Sphere" (öffentlichkeit), which enabled the bourgeoisie to participate in the process of discussing social issues and making various decisions which were influential in the formation of the laws regulating social life. It is thought that it cannot be interpreted easily and this has caused controversy. The debate over whether the Social Media can be treated as the new Public Sphere is the focus of this current study. The study will debate whether it will be effective in creating important socio-global outcomes, participation and the global educational debate.

Keywords: Social Media, Habermas's Public Sphere, Society Involvement-Global Involvement.

INTRODUCTION

The continually developing mass-media makes individuals technologically able to gather local and international information much faster and facilitates the process of expressing their thoughts. With the rise of the Internet in particular, the debate over whether its usage is positive, such as for gathering data, expressing thoughts, performing useful discussions on local and international issues, or whether it is negative, by transforming the society to a *society of the spectacle*, enabling illegal access to individuals' private data and lives, causing unrest in nations, disrupting or even removing states' authority, has been extensively discussed. The positive argument regarding the usage of the Social Media - the media taking an important place in the Internet - has led to comparisons between the Social Media and Habermas's bourgeois Public Sphere.

* The study is developed from the paper introduced at the International Educational Technology Conference (IETC 2017) held in the Harvard University Campus, USA in 16-18.08.2017 by the authors.

GENERAL INFORMATION

Methodology

In the study, the Social Media is compared and contrasted with Habermas's bourgeois Public Sphere. It will be examined whether it is effective in creating social-global impacts through providing nationwide or even global informative discussions.

The scope of the study is drawn within the framework of the Social Media and the Public Sphere Theory of Habermas. Firstly, the Public Sphere Theory of Habermas and secondly the New Media - the Social Media - are explained. Subsequently, the two concepts are compared and contrasted to determine the possibility of interpreting the latter as the new Public Sphere.

The data gathered about the two concepts is examined through content analysis and their commonalities and differences are viewed through comparative analysis.

Öffentlichkeit (Habermas' Public Sphere)

"*Öffentlichkeit*", meaning "*Public Sphere*" in English, is a term that has been used throughout history, and the meaning has transformed over time. The word means *the public, something concerning the public, and common* in German. However, the book, *Strukturwandel der Öffentlichkeit*, written by J. Habermas in 1962, was translated to English as *The Structural Transformation of the Public Sphere*. Thus, *öffentlichkeit* acquired the meaning of *public sphere*. Differing from its German meaning, its English translation includes the meanings referring to spatial, physical, and topographic elements. However, in the original theory, the word carries a meaning beyond spatial logic, as it is described by Habermas as a general sphere not as a physical arena (Falay, 2014: 52).

In his study, he follows the meaning and its changing uses of the concept in Western society, starting from its meaning in everyday language to the second half of the 19th century when he draws the framework of the theory of *the ideal public sphere*. According to Habermas, *the ideal public sphere* is the *bourgeois Public Sphere*, which materialised under specific sociological circumstances at the end of the 17th century (Köroğlu & Köroğlu, 2013: 915).

Before describing the *ideal public sphere*, he refers to the three public spheres based on different historical periods. The first one arose in the middle-ages; however its foundation was based on an administrator or a landlord, not on the public itself, and therefore it is a representative and it is not related with the latter two spheres. The first one represents the authority, it has the masses in front of it, and such a representation occurs in front of the public, although it does not actually include the public. The second sphere is *the literary public*, which occurred after the Middle Ages and the last one is the political or *bourgeois Public Sphere*, whose intellectual accumulation came from *the literary public* (Köroğlu & Köroğlu, 2013: 915).

It is possible to discuss the two major developments in the rise of Habermas's *bourgeois Public Sphere* (Melton, 2011: 15-16; Falay, 2014: 53).

- With the formation of the modern nation states at the end of the 16th century, *the concept of society* appeared as a separate concept of *the state*. *The state* is interpreted as *the public power (policy maker)*, while *the society* represents *the private interest and activity's sphere*. In particular, during the absolutistic regimes of the 17-18th centuries, phenomena like *monarch* and *special subject to the monarch* empowered this division between the two and this division formed the primitive style of what Habermas called *the public sphere*.
- On the other hand, with Capitalism, the relationship between *the state* and *the society* was almost terminated and with the acceleration of the circulation of materials increasing with the development of national and international markets, the communication net also improved. In particular, it was in the 19th century when the *public* and *private* spheres were distinguished from each other.

In the Middle Ages, the homes of the nobility were not only the centre of control/domination, but were also the centre of production which was later assumed by the free market; thus the concept of home gained the meaning of something that was more private. However, the importance of home gained another dimension as private property provided families with privacy; nevertheless, such privacy caused those who were not members of the family to be excluded, which contradicted the concept of *being open to all* according to the *bourgeois Public Sphere* (Falay, 2014: 53-54). In the Middle Ages, with the advent of the *home as the space of privacy*, the concept of *street* also gained a different quality. The street assumed a quality that was out of the private space and without which, socialising would be considered impossible.

Habermas argued that the *public street* as well as coffee shops, salons and clubs were the centres which were independent of the state, in which opposite views to the state were formed in the 18th century. Here, *the public sphere* defines a structure which is formed by the individuals themselves (Habermas, 2002: 63), not by *the will* formed in the representative public structure (Habermas, 2002: 80). The *bourgeois* first came together to discuss literature in this private sphere and then they began to use it as an independent sphere of the state and economy, where political issues were debated and opposite views to policies were expressed.

His understanding of the Public Sphere bears some specific basic criteria:

1. Ignoring the social statuses

Rank/positions are replaced with equality. *Power and dignity* gained through *public positions* and *financial dependencies* lose their importance in this context.

2. Questioning those issues that were not discussed previously.

Individuals have easier access to materialised cultural productions due to the effect of Capitalism, which gives the opportunity for them to be discussed commonly.

3. The Public Sphere must be open to all citizens.

The essence is to include everyone in the discussion of societal issues. If discussions are held only by a limited group of people, then the public sphere can no longer be considered public.

He argued that such a sphere should fundamentally assume the systematic and critical role of controlling the policies of the public authority.

The New Media and the Social Media

The concept of New Media was introduced to information and communication based studies by researchers studying social, psychological, economic, political, and cultural phenomena over 40 years ago. Nonetheless, the meaning of the concept has evolved and expanded with the advent of the digital age and Internet technology, which accelerated in the 1990s. It has been observed among New Media that social sharing sites like Facebook and Twitter have been established in a short period of time and they are reaching an ever increasing number of users (Avşar & Öngören, 2010: 13; Dolunay & Kasap, 2017, 535).

Social Media has transformed into a tool for creating media content, discussing views, and sharing many things mutually. It has already become a space that covers different areas of life and determines the life styles of people.

Today, it is undeniably a medium which is able to combine all forms of communication media under one structure, providing people with the opportunity to socialise and communicate. People can easily share their views and thoughts with each other. Before the New Media, the sharing of views face-to-face was only possible in a limited physical environment or with the assistance of the printed and visual media. However, everyone is now capable of sharing with the larger masses with the advent of the New Media. Individuals in separate geographical locations can connect through virtual spaces to share and discuss their views

The social net is defined as the Internet environment where people can communicate with people from different cultures after they define themselves as well as where they socially communicate, share their feelings and thoughts with others regarding their normal daily lives with the help of symbols representing gestures and mimics (Koç & Karabatak, 2011: 1).

The Internet, through the use of Web 2.0 technology, has become a global phenomenon. Previously, there was only a limited number of newspapers that were circulated and read globally. Now, each individual who writes on virtual environments has the potential to express their thoughts globally. Any individual's writing can reach someone on the other side of the world. Naturally, this has changed the media, Internet publishing and journalistic techniques.

According to Christopher Callahan, the Internet seems to be the only source of information that can be accessed around the world. The more data that is uploaded, the more effective it will be. Journalists' desire for information is endless (Callahan, 1999: 1). The intersection between the Internet and journalism has caused an important difference today. *The networked journalism*, whose news gathering, processing, and delivering stages' centre is based on the digital, online technologies and the Internet is an example of this difference (Beckett & Mansell, 2008: 93; Aydoğan, 2012: 25).

COMPARING AND CONTRASTING THE SOCIAL MEDIA AND THE PUBLIC SPHERE

The Space and Participation

According to Downes (2005), the social net is the connection of the individual nets coming together through the interrelationships' sets (Downes, 2005: 411). A social net is defined as the act of interaction among a group of people, organisation or community who share sources and information to achieve desired ends (O'Murchu & Breslin & Decker, 2004: 9).

As mentioned above, the English translation of *öffentlichkeit* does not address the exact meaning of the word in the original theory of Habermas's Public Sphere. In the *bourgeois Public Sphere*, *home* is defined as a *private sphere*, while *street* represents the *Public Sphere* hence, the meaning is still combined with *arena* and not with *sphere*.



(The Bourgeois Public Sphere)

As mentioned above, *the Bourgeois Public Sphere* appears and is maintained in locales such as clubs, salons, and coffee shops. In this regard, McLuhan's argument that *the medium is the message* must be considered. McLuhan opposes the long-lasting argument that the point is the neutrality of the medium, arguing that the chosen medium is the message itself as it is chosen consciously and it bears certain messages. When *homes* become *the private spheres*, whose productivity quality is assumed by the free market, which structure will assume the role of the centre of control?

Habermas explained the Bourgeois Public Sphere as a sphere that is open to everyone when discussing the social issues to determine appropriate solutions, saying, "it must be something which cannot be locked. On the other hand, as its name denotes, it is the sphere of the bourgeois, which means that the participants are formed of only one class and imposed decisions can still be taken there.

Additionally, because *homes* are the places of privacy that rely on the concept of private property, those that do not own property are externalised from the family sphere. Moreover, women do not exist in his public sphere as well. Seemingly, *only the bourgeois* makes the sphere closer, which is not open to other social classes.

However, in comparison to Habermas's Public Sphere, the Social Media exists in the virtual environment, which is a platform open to all. It provides people with the opportunity to connect virtually, without the necessity to meet physically, in order to discuss their common concerns.



(Humans and Social Media)

Özbek explained the Public Sphere as: "the sphere of the democratic opposition which critically scrutinizes and transforms the arbitrary and repressive Power, which is principally and historically concentrated in the state instrument (Özbek, 2004, 132). In this regard, the public sphere has the quality that it is both independent of the state as well as a critical element of it (Yegen, 2013: 128).

Nevertheless, when the Social Media is considered, its users are aware that they are being watched by the Power; moreover, they can support or criticize the Power only with its permission for usage. Another fundamental difference between the two is that the Social Media is not only used to criticize the Power, but also to support it.

Furthermore, the principal of the privacy of private life is respected more by the traditional media than by the social media. The user seemingly shares the content in a private sphere, yet it is actually shared on a public platform. Thus, the privacy of the user is transgressed. Having his/her privacy in a secret and independent sphere is an integral part of his/her fundamental rights and freedom. The private life is the sphere in which an individual has the right to relaxation and freedom, which is not open to everyone and related with his/her own private world. The acts of observing, searching, and disseminating to others the activities performed by an individual within this private sphere without his/her consent transgress the individual's rights (Kahraman, 2008: 110).

Aims

From the outset, the public sphere was formed of a structure in which people came together in coffee shops, salons and other locations for the purpose of socialisation. Subsequently, they began to discuss literature and later, the sphere gained a political character through which the Power was criticized, social issues were debated and ultimately decisions were taken. The sphere aims to reach a consensus among differing views in order to make future decisions and to enact essential laws.



(Discussing the War in a Paris Cafe – Public Sphere)

However, the Social Media is not only for the purpose of discussion, but also for obtaining news as well as for entertainment. It facilitates people's ability to contact each other. The communication that occurs on Social Media, which does not requires users to be geographically close or have face-to-face connection, leads to the communication being fast, but also artificial.

The social media also leads to the bombardment of information. For example, an individual who wants to know where another individual has been and when they were there, can access such information by clicking on his page. The structure of communication enables users to share the views mutually and to give feedback to each other. Thus, it has become an indispensable part of everyday life. An individual can share and discuss his/her opinions mutually and publicly. There is no longer the necessity to come together as homogenous users. Heterogeneous users may share the same virtual environments.

In Habermas's Public Sphere, however, only one class's participation is observed; in fact, statuses, titles as well as economic dependencies carry significant importance. However, equality is the key principle. Although some exceptions are possible, differing views can be maintained and after a consensus is reached, common decisions are taken. Nevertheless, the discussions that occur on the Social Media are not aimed at reaching a consensus. The different sides in a discussion may also be in a superiority competition, which makes it difficult to achieve social/mass-related positive ends. Another difference is that the Public Sphere only focuses on discussing the societal (public-related) problems, whereas the Social Media is not only aimed at societal, but also at masses-related subjects, as the latter is a mass media medium. According to Baudrillard, "*Mass is a black hole absorbing the societal*" This view reflects the dark face of the issue in connection with the theory of the Simulation Universe. In this theory, reality is questioned and it is argued that people do not actually live in the reality. Along with other factors, this simulative structure is developed with the help of the mass media. The mass media, such as newspapers, were originally designed to provide news and inform people. Then, they started to assume entertainment qualities. This quality has become increasingly sophisticated with the rise of the Internet and the Social Media. However, the media not only informs, educates, and entertains the masses, but it has also become a medium of shaping perceptions. For instance, in the Arab Spring, people organized, came together and participated in mass demonstrations through the help of the Social Media. After the Arab Spring, which expressed the prevalent social issues and unrest, it is now only perceived as a simple medium of socialisation, but also an important way of organizing.



(Perception Management via Social Media)

On the other hand, from a more positive perspective, because not only the societal but also mass-related discussions are held to suggest solutions the Social Media, this creates the image of a mass sphere. As McLuhan previously identified in his theory of the global village, individuals discussing on the issues may sometimes make universal decisions that are acted upon, although the “*world citizenship having a common view*” has not been achieved yet. For example, in the Gezi Park events, although the protests started in a small area of Istanbul, they later expanded to a global scale and achieved wider support, and the park was ultimately preserved. The park, which the government had planned to destroy in order to construct a new shopping centre, still survives as a green area with many trees even though 4 years have passed.

The Impact It Creates

The Social Media is also used to increase the societal awareness. Efforts to form public opinion decrease, while larger masses can be reached in a shorter period of time. Although the Gezi Park events were initiated by a few people, the protests expanded to larger masses over a period of one month.

Evidently, it now plays a pivotal role in disseminating local issues to people throughout a country or around the world. While in the era of the newspapers, only a certain amount of information was allowed to be published, with the advent of the Internet, uncensored information can now spread at amazing speed. Thus, societal awareness can be created.

It is observed that the reason behind new societal movements is not ‘the economics, social, internal affairs, and the military security’, but it is the life-quality, equal rights, individual self-actualisation, participation and the human rights’ (Karagöz, 2013: 135). The structural characteristic of activists is that they are higher education graduates, economically well-positioned, and middle-class university students (Offe, 1999: 60; Yılmaz, Dündar, & Oskay, 2015: 258).

In Habermas’s Public Sphere, economically similar individuals come together, while in the Social Media, people from all economic strata can participate. Furthermore, people become addicted to it voluntarily, as it provides them with the ability to show myriad products, which cannot be shown in real life. This addiction leads to individuals sharing of all of their photos and videos portraying all aspects of their lifestyles.

This virtual life has created *the society of the spectacle*. Veblen interpreted that ostentatious consumption is an individual’s way of expressing their wellness. The basis of their desire to flaunt their wealth is the underlying thinking that richness is directly proportional with power. In this regard, people perceive themselves to be stronger when they are richer, and the opposite perception occurs when they become poorer. In ostentatious consumption, people consume not only to satisfy their factual needs, but also in order to be appreciated by others. The social and cultural interest in the ostentation in a society, directs people’s behaviours. (Veblen, 2005: 97; Kadioğlu, 2013: 111).

Today, digital reactions on the Internet can have as much of an impact as street demonstrations. Journalists scan Facebook and Twitter before agenda setting meetings, and topics discussed on the Social Media can become agenda items for newspapers as well news bulletins. Moreover, according to the Institute of Politics, Democracy and the Internet in the USA, Internet activists have seven times more impact power on policy makers than those demonstrating on the streets, because of their ability to reach larger masses (Savaş, 2013; Yılmaz, Dündar, & Oskay, 2015: 490).

ANALYSIS

The Field and Scope

- Whereas the Public Sphere has a structure based on coming together physically in places such as coffee shops and salons, the Social Media has a foundation that is reliant on virtual working on the basis of digital coding.
- The Public Sphere is a phenomenon where issues related with the country in which the meetings’ places are located can be discussed; however, the Social Media is a phenomenon where time and space limitations are removed and where not only local or national, but also global issues are debated.

Aims

- In the Public Sphere, although *openness to all* is emphasised, only one class (bourgeois) can actually enjoy the sphere. Nevertheless, the Social Media includes individuals from all classes as well as from all of the economic and educational strata. Therefore, the aims of both spheres differ, as the former is only societal (national), while the latter is societal as well as masses/classes-related.
- The Public Sphere only seeks to open up societal discussions to argument with a limited group, with the aim of reaching consensus in order to find a solution and resolve the problem. The Social Media, on the other hand, is open to a larger amount of people worldwide and, as the main concern, instead of reaching a consensus, informing, educating and entertaining people as well as shaping the perceptions are more important. Moreover, in the Social Media discussions, one-upmanship and exhibiting status are increasingly prominent.

The Impacts it Creates

- The Public Sphere is where people with similar economic statuses discuss the societal issues with the desire to enacting the related national laws and to solve problems. Thus, its effect is national and it only provides the opportunity to organise nationally, while introducing ideas and suggestions.
- The Social Media welcomes a myriad of initiatives. This assumes a role in setting the agenda on multiple societal issues. It provides the users freedom, which results in individuals' self-actualisation. It creates the opportunity to organise beyond national boundaries. Individuals can be informed about global issues easily and more rapidly. Thus, they can form and introduce their own ideas and suggestions.

CONCLUSION

If the comparisons and contrasts between the two of the concepts are summarise, the Public Sphere relies on physical environments, such as coffee shops and salons. However, the other sphere is based on working in the virtual environment using the digital coding system of the Internet.

While the Public Sphere is closer and only open to the bourgeois in the reality, the Social Media is open to everyone from all statuses and classes.

The main concern in the Public Sphere is to discuss the issues to reach a consensus with the end goal of finding a solution. On the Social Media, the aim is not to find a consensus and the primary concern is to inform, educate and entertaining people and shape their perceptions.

Aside from their differences, both have limited similarities in terms of their educational qualities. Societal and global topics are also opened up for discussion on the Social Media. Nevertheless, the aim is not to reach a consensus. Therefore, only if it is used consciously by the users can results be achieved, messages can be sent to public or global figures and policy making can be affected.

The result of the study shows the Social Media may not be deemed as a completely new sphere. However, it can be evaluated as a new sphere in a limited manner if users have commonalities in terms of their aims and the goals they wish to achieve.

REFERENCES

- Avşar, Z. & Öngören. (2010). *Bilişim Hukuku*. İstanbul: Türkiye Bankalar Birliği Yayınları.
- Aydoğan, A. (2012). İletişim Araştırmalarında İnternet Gazeteciliği; Bağlamsal Çalışmaların Eksikliği. *İletişim Kuram ve Araştırma Dergisi*, 35, 20-41.
- Baudrillard, J. (1998). *Simülakrlar ve Simülasyon* (Çev. Oğuz Adanır). İzmir: Dokuz Eylül Yayınları.
- Beckett, C. & Mansell, R. (2008). Crossing Boundaries: New Media and Networked Journalism, *Communication, Culture & Critique*, 1(1), 92-104.
- Callahan, C. A. (1999). *Journalist's Guide to the Internet, A: The Net as a Reporting Tool*, USA: Pearson.
- Dolunay, A. & Kasap, F. (2017). Basın Hak ve Özgürlüklerinin Yeni Medya Üzerinden Değerlendirilmesi: Kuzey Kıbrıs Türk Cumhuriyeti Örneği, *1. Uluslararası İletişimde Yeni Yönelimler Konferansı*, 521-533. İstanbul: Nobel Yayıncılık.
- Downes, S. (2005). Semantic Networks and Social Networks, *The Learning Organization*, 12(5), 411-418.
- Falay, N. (2014). Kamusal Alanın Oluşumu, Dönüşümü ve İktisadi Boyut, *Journal of Life Economics*, 1(2), 51-70.
- Habermas, J. (2002). *Kamusal Alanın Yapısal Dönüşümü* (Trans. Tanıl Bora and Mithat Sancar), İstanbul: İletişim Yayınları.
- Kadioğlu, Z. K. (2013). Kitle İletişim Araçlarının Şekillendirdiği Sosyal Kimlikler Ve Aidiyet Duygusu Ekseninde Tüketici Davranışları. *İstanbul Üniversitesi İletişim Fakültesi Dergisi| Istanbul University Faculty of Communication Journal* (45), 101-114.
- Kahraman, A (2008). İslam Hukuk ve Ahlak İlkeleri Işığında Özel Hayatın Gizliliği. Ankara: Ebabil Yayınları.
- Karagöz, K (2013). İletişim ve Diplomasi, *Basın-Yayın ve Enformasyon Genel Müdürlüğü*, 1(1), 131-156.
- Koç, M. & Karabatak, M. (2012). Sosyal Ağların Öğrenciler Üzerindeki Etkisinin Veri Madenciliği, *e-Journal of New World Sciences Academy*, 7(1),155-164.
- Köroğlu, C. Z. & Köroğlu, A. M. (2013). Klasik Kamusal Alan Modelleri ve Türkiye'nin Kamusal Alan Tecrübesi Üzerine Genel Bir Değerlendirme, *International Journal of Social Science*, 6(4), 913-936.
- Melton, J. V. H. (2011). *Aydınlanma Avrupasında Kamunun Yükselişi* (Trans. Ferit Burak Aydar), İstanbul: Boğaziçi Üniversitesi Yayınevi.
- O'Murchu, I. & Breslin J.G. & Decker, S. (2004). *Online Social and Business Networking Communities*, DERI Digital Enterprise Research Institute Technical Report, Washington, DC.
- Offe, C. (1999). Yeni Sosyal Hareketler: Kurumsal Politikanın Sınırlarının Zorlanması, *Yeni Sosyal Hareketler*, (Ed. Kenan Çayır), İstanbul, Kaknüs Yayınları.
- Rigel, N. (Ed.), (2005). 21. yy İletişim Çağını Aydınlatan Kuramcılar: Kadife Karanlık. İstanbul: Su Yayınevi.
- Savaş, A. (2003). Klavye Delikanlılığı mı, Devrimin Anahtarı mı? Retrieved from: <http://www.sabah.com.tr/pazar/2013/01/06/klavye-delikanliligi-mi-devrimin-anahtari-mi>. Erişim: 14.07.2017
- Veblen, T. (2005). *Aylak Sınıfın Teorisi* (Trans. Zeynep Gültekin & Cumhur Atay), İstanbul: Babil Yayınları.
- Yegen, C. (2013). Demokratik ve Yeni Bir Kamusal Alan Olarak Sosyal Medya. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*, 1(2), 119-135.
- Yılmaz, B., Dünder, G., & Oskay, T. (2015). Dijital Ortamda Aktivizm: Online İmza Kampanyalarına Katılım Davranışlarının İncelenmesi (Kocaeli Üniversitesi İletişim Fakültesi Öğrencileri Üzerine Bir Araştırma). *Intermedia International Peer-Reviewed E-Journal Of Communication Sciences*, 2(2), 481-504.

The Effect of Structure in Flipped Classroom Designs For Deep and Surface Learning Approaches

Fatma Gizem KARAOĞLAN YILMAZ

Bartın University, Turkey

gkaraoglanyilmaz@gmail.com

H. Tuğba ÖZTÜRK

Ankara University, Turkey

tozturk@ankara.edu.tr

Ramazan YILMAZ

Bartın University, Turkey

yilmaz04@gmail.com

This research was supported by the Scientific Research Projects Commission of Bartın University, Turkey. (Project No: 2014-SOS-A-003).

ABSTRACT

A growing body of research is concerned with the implications of Flipped Classroom (FC) model at higher education institutions. There is a wide range of the opinions and experiences on FC model and the model is still being tested by the researchers and practitioners. For the purpose of examining best practices in FC models, the present study was conducted to investigate the effects of structure in the FC models on academic success of the students who adopt deep and surface learning approaches. The study was conducted quasi-experimentally with 119 students. A pre & post achievement test and a study process questionnaire were used to collect data. The results indicate that scores on academic success of students learning in structured FC model is significantly higher than the scores of the students in flexible-structured FC model and control group. In terms of study process approach, the students in FC models who adopt deep learning approach scored significantly higher on achievement test than the students in control group while there is no significant difference between experimental groups. The results are the same for the students who adopt surface learning approach. The outcomes of this study have implications for designing an FC model and strategies for the practitioners.

Keywords: Inverted classroom; flipped classroom; surface and deep approaches; structured and flexible-structured flipped classroom

INTRODUCTION

It is important to promote meaningful learning environments in all levels of education. With regard to higher education institutions, there has been increasing number of studies regarding leveraging deep learning of the students against the assumption that "most students in most undergraduate courses become increasingly surface and decreasingly deep in their orientation to learning", while the generic aim of teaching is to promote meaningful learning (Biggs, Kember, & Leung, 2001; pg. 5-6). As Beattie, Collins and Bill (1997; pg. 1) remark in recent years, deep learning has been a concern of evaluations of higher education relative to surface learning and these concepts which were developed in 1970s and 1980s are now well-founded in higher education literature. Today, in line with the discourses to engage the students with meaningful and effective learning experiences, information and communication technologies (ICTs) have been integrated into education underlined with the pedagogies such as active learning. A concrete and prominent example of this is Flipped Classroom (FC) model, which have two important pillars as technology and pedagogy of active learning, has been rapidly accepted mainly by higher education institutions (Estes, Ingram, & Liu, 2014). In this model, essentially, students are provided with pre-course materials to get ready for the course through systematic use of ICT and it is aimed to promote interaction and the meaningful learning activities that occur during the face-to-face time" (Bergmann, Overmyer, & Willie, 2012; np).

Deep and surface learning in higher education

Deep learning refers to high level of cognitive activities such as critical and creative thinking, problem solving skills and engaging the learning activities and content (Salmon, 2004; James, Chin, & Williams, 2014) while surface learning is associated with rote and temporary learning (Beattie et al., 1997). In the literature, students' approaches to learning concern individual traits such as motivation and attitudes (Beattie et al., 1997) and also a host of factors such as students' perceptions of task demands, instruction methods, classroom climate and so on (Biggs et al., 2001).

FC model as a kind of blended learning (Staker & Horn, 2012) has the potential to foster deep learning (James et al., 2014) as it is a comprehensive model consisting of the elements influencing the students' approaches to learning. It is remarked in the literature that as a kind of blended learning, FC model helps with managing cognitive load (Turan, 2015) possibly because of the reason that the resources are provided to the students prior to the course (Seery & Donnelly, 2012) so that the students could process the knowledge beforehand, and the content is presented in chunks (Mayer & Moreno, 2003). In line with these finding in the literature, Garrison and Kanuka (2004; pg. 13) also provide a discussion of blended learning's potential to support deep and meaningful learning; however they suggest that "systematic evaluation of satisfaction and success of the teaching, learning, technology and administration of new course" is necessary. In terms of evaluating the different variables for providing the students with deep learning processes, it is important to examine learning experiences of the students who adopt surface learning and deep learning approach in an FC model. Biggs et al. (2001) refer to two learning approaches of students as deep and surface approaches. This identification is important in the context of an FC model in understanding its effectiveness on the students who adopt different learning approaches. Yilmaz and Orhan (2011) articulate that the students with surface approach tend to perceive learning tasks (e.g. assignments) as a burden, and to narrow their focus to the learning activities connected with the assessment of the course. Given the facts that FC model is inherently carried out with the learning responsibilities (such as assignments) materialized out-of-class times, and usually specific tasks (such as watching videos) are given to the students; the experience and success of these students need to be examined. On the other hand, it could be assumed that FC model could be best suited with the students who adopt deep approach as this approach enables students to learn from the educational materials. When considering that the relationship between deep approach and high academic success was established in the literature (Yilmaz & Orhan, 2011), it is expected that in a course designed with FC model the students with surface learning approach might not perform better than the students with deep learning approach.

Against this background, to sum up, taking a surface learning approach is one of the problems experienced in higher education today, and learning technologies along with an active learning pedagogy have been adopted in education as a promising medium in education in order to engage students with active and meaningful learning. At this point, it is believed that FC model has the potential to promote deep learning associated through systematic use of ICT and meaningful interaction time in class. However, given the fact that there are also students who adopt a surface learning approach, it is important to design an FC model helping surface learners engage in meaningful learning experiences.

Learning Structure and learning approaches in FC models as a blended learning

Drawing on the literature, Kalelioğlu (2011) defines structure as a way of designing the learning environment using instruments such as planning and organising the activities, roles, teacher support, aims, instructions, rules, group formations and resources. Moore (1993) defines the structure as an extent where an education program meets individual learning needs of the students (cited by Yilmaz, 2014). According to Moore, if learning activities are not designed in a flexible structure and unable to meet learning needs of the students, the transactional distance, "communication and psychological distance (not geographical distance) between instructors and students" (cited by Chen, Wang, Kinshuk, & Chen, 2014, pg. 19), would be increased.

There has been increasing literature over the past ten years aiming at reaching the best practices of FC models in higher education. If it is aimed to promote meaningful and active learning experiences in blended learning systems such as an FC model, it is important to consider the amount of learning structure. Drawing on the literature, Salter and Conneely (2015) argue that providing structure to students might have a different level of impact on student engagement, and critical engagement has the potential to lead deep thinking, interactive activities and educational experiences. Also, usually in a flexible learning design students are regarded as active participants and they are supported by deep learning (Drennan, Kennedy, & Pisarski, 2005). Here, structure is one of the key aspect of distance education systems. Chen et al. (2014) note that in flipped classrooms transactional distance is changing constantly and in the situations which the students watch videos at home, transactional distance is high due to the lack of communication between the students and the instructor. Chen et al. (2014) stress that high transactional distance might have negative effect on learning experiences such as poor learning and in that sense, Moore and Kearsley (2011) recommend to increase dialogue as well as to decrease pre-determined structures. They point out the proper combinations of structure and dialogue which has the potential to engage students with effective learning.

On a closer look at the relationship with the learning structure in distance and blended learning systems and deep learning experiences, there are controversial debates on the extent of a learning structure and likely consequences of the structures. For instance, in a flexible-structured discussion forum, when students are allowed to dictate what they want to learn, then they are inclined to explore the course topics more broadly whereas they "may not know to how create a dialogue that is engaging and involved" (Salter & Conneely, 2015, pg. 20). On the other hand, there are findings in the literature which support the view that putting the structure into the learning environments can help obtain positive learning experiences. In their study, Cadwick and Ralston (2010) identified that when the structure is provided in the student discussions, students' higher order perspective-taking and learning is correlated with each other in structured discussions. In line with this, Kalelioğlu (2011) reports that the participants in her study performed critical thinking skills mostly in the structured/guided environment.

A further point in regard to the structure in distance and blended learning is concerned with the individual differences. Researchers point out that individual differences and students' approaches to learning should be taken into account in learning environments (Hall, Ramsay, & Raven, 2004; Wilson & Fowler, 2005; Yilmaz & Orhan, 2011). However, on a closer examination, in some studies, there is no significant statistical result found in relation to the individual differences and learning structures in blended learning environments. According to a study by Zheng, Flygare and Dahl (2009), there is no significant difference between the students with different cognitive styles in well-structured and ill-structured online learning environments, whereas students showed different levels of performance based on the mean average. Also, as reported by Yilmaz and Orhan (2011; pg. 1028), there is no significant difference in "academic achievements, web material using behaviors, and attendances to face to face and Web based learning environments" between the students who adopt surface and deep learning approach. However, returning to the point raised by Moore (1993) suggesting that individual differences should be taken into account due to the transactional distance in distance learning systems and influence of individual differences on students' performance in different learning environments as presented earlier, there is a need to further examine learning experiences of the students with various individual differences. In the scope of the present study, as a type of individual difference, students' academic success with deep and surface learning approaches will be examined in FC model as an emerging model in education based on the learning structure.

RESEARCH PROBLEM

Biggs (2003; pg. 31) assumes that “surface and deep approaches to learning are not personality traits, as is sometimes thought, but are most usefully thought of as reactions to the teaching environment”. In the same fashion, Bonwell and Eison (1991) point out that many individuals adopt learning styles which best suit with pedagogical techniques rather than lecturing. In that sense, providing deep and surface learners with suitable learning environments consistent with their learning characteristics would enhance their learning experiences. Given the varying effects of different levels of structures on the students, it is important to investigate learning experiences of the learners who adopt surface and deep learning approaches. At this point, Hung (2015) suggests that there is a need to examine effects of structured versus flexible-structured flip lessons on student learning. In this context, the main purpose of this research is to compare the academic success of the students who learn with deep and surface learning approach in structured and flexible-structured FC models. Against this background, following hypotheses were generated:

H1: The students learning in structured FC environments have significantly higher academic success than the students learning in flexible-structured FC environments and traditional learning environment.

H2: The students with deep learning approach in the structured FC environment have significantly higher academic success than the students with deep learning approach in flexible-structured FC environment and traditional learning environment.

H3: The students with surface learning approach in the structured FC environment have significantly higher academic success than the students with surface learning approach in flexible-structured FC environment and traditional learning environment.

METHODOLOGY

Designing the research site

A quasi-experimental research was carried out with 119 first year students enrolled in Computing I course. In the course, it was aimed to teach word processing, spreadsheet and presentation software to the students studying at a faculty of education in Turkey.

Participants of the research

Table 1 below summarises the number of the participants based on the departments.

Table 1. Participants of the research based on the departments

Departments	Frequency	Percentage
Psychological Services in Education	41	34.45
Elementary Mathematics Education	40	33.61
Social Science Education	38	31.93
Total	119	100.0

Participants in this study were 119 first year students from 3 different departments taking Computing I course. As a result of random assignments, Experimental Group I (EG I) consists of the students in the department of Psychological Services in Education; Experimental Group II (EG II) consists of students in the department of Elementary Mathematics Education and Control Group (CG) consists of students in the department of Social Science Education.

Study process

The study process consists of two stages. At the first stage, the research was designed based on the research questions and a technical infrastructure was built up. In the second stage, experimental procedures were carried out and then data were collected.

First stage: The research design

At this stage, the Experimental groups were formed and digital materials (e.g. quiz, videos, readings and guidelines) were produced and then placed on Moodle. A learning group consisting of students were formed on Facebook for communication purposes.

Drawing on the research problems, two experimental groups were formed and an FC model was adopted in these groups. In addition, one group was formed as a control group and the course was run in face-to-face session without the digital materials produced for the experimental groups whereas syllabus remained the same.

Experimental groups were formed as flexible-structured and structured FC model. Moore (1993) defines the structure as curriculums' potential to meet individual learning needs of the students and drawing on this definition (cited by Yilmaz, 2014), it was aimed to examine which FC model best suits with the students adopting deep and surface learning approaches. In the next section, formation of experimental groups based on the course structure will be expanded.

Experimental Group I (EG I). Flexible-structured flipped classroom model

Chen (2003; pg. 25) argues that "in order to make one aspect of the instruction flexible, usually other aspects have to be made more structured". In the case of present study, the assessment, tasks and digital resources were structured so as to guide the students with clear targets, in other words, they were informed about assessment, learning tasks to be fulfilled and digital resources to be utilised for learning online before in-class time.

In line with this, Chen (2003) suggests that in a commonly accepted flexible learning definition, students must be provided with flexible access at least one of the following learning elements: time, place, pace, learning style, content, assessment and pathways. In the case of EG I, in terms of time, the students were allowed not to attend to the class but they were required to submit their assignments before the subsequent week begins. In terms of place, they could watch online videos anywhere including the computer labs. In regard to the element of learning style, as Chen (2003; pg. 25) remarks that flexible learning by definition requires students to actively engage in learning process "and that students should be more independent and more responsible for their own learning". In the case of EG I, during in-class time, the students were asked to fulfil hands-on tasks in the computer laboratories and submit their assignments. When they failed to perform the tasks before the course hours ended, then supportive videos on how to perform the tasks were provided to them online and they could submit in a week time. The tutor was also in the laboratories to assist students with their tasks but the interaction between the students and the tutor were limited with the time and student/tutor ratio. Therefore, rather than tutor-student interaction in face to face sessions, the teaching and learning methodology of the course was informed by peer interactions. When the course was structured in this way, it helped the students to empower their learning experience with peer collaboration, self-regulated learning via digital materials and also feedback from their tutor, otherwise the huge number of the students working in a computer lab with limited number of computers would constrain the tutor's teaching practices within these conditions. Thus, EG I's learning experience was underlined by characteristics of flexible learning as collaboration with peers, support of learning resources, context-sensitive learning experience and teacher as a facilitator (Chen, 2003).

However, in a flexibly designed FC model it is important to examine learning experiences of the surface learners because although the students with deep learning orientation might take an active role by engaging in digital resources before the class and "come to most classes with questions in mind" (Biggs et al., 2001), the students with surface learning orientation might merely follow what they are asked to do without a deep engagement with the course content. Although a week time is assigned for students to study on the weekly course content and submit their assignments, these students might minimize the time to learn the content on surface rather than allocating more time for deep learning. Therefore, their academic success must be examined in a flexibly designed FC model.

Experimental Group II (EG II). Structured flipped classroom model

In distance education systems which are usually delivered mainly via instructional videos and these are the environments where there is not significant amount of feedback and interaction mechanism, the structure of these courses is described as structured course (Yilmaz, 2014). Usually what makes a course structured is all about unchangeable course goals, a single teaching and learning method and limited options of assessment (Yilmaz, 2014). Also, unlike flexible learning, these courses are teacher-centered.

Learning tasks and learning resources given to the students in EG II are similar to the tasks in EG I, Although these tasks and learning resources in EG II are more structured. The students were expected to watch the videos before the class and instructed by the teacher. The students were required to attend in-class time courses. As learning and teaching methods, question and answer methods as well as didactic teaching methods were adopted; thus source of the interaction mainly relied on the dialogue between the teacher and the students. The assignments were due on the same day of the in-class course and the students were not given extra time unlike in EG I.

In regard to the structured learning models as mentioned above, Moore and Kearsley (2011) remark that the more an educational program is structured the less it has the potential to accommodate individual needs of the students as the students are provided with limited number of alternatives. From this point of departure, it is expected that students who adopt surface approach to learning might not be actively involved in learning process due to high structure of the course and hence their learning experience needs to be examined.

It is important to note that in both of the groups, same syllabus, learning tasks, technology and assessment methods (e.g. marking assignments and achievement tests) were employed. Among flexible learning elements, teaching and learning methods, time and place were applied differently in order to examine how to best accommodate learning needs of the deep and surface learners.

Other designing issues on FC model

As Kim, Kim, Khera and Getman (2014) suggest "The design of flipped classrooms has often been limited to the concept of replacing in-class instruction with videos and using class time for homework" while FC concerns "flipping conventional events both inside and outside of the classroom and supporting them with digital technologies" (Hughes, 2012, pg. 38). In that sense, it was aimed in this research to promote students' learning before the class by videos and supporting digital materials such as e-books and presentation documents.

Videos were produced for the purpose of teaching students the basics of the course content as well as showing them how to fulfil the hands-on activities. As an example of hands-on activities, the students were given a list of fictional students whose two exam results were presented on a spreadsheet as a working sheet. A guideline was given on the spreadsheet and they were asked to calculate scores of the fictional students by calculating 40% of the first exam results and 60% of the second exam results. Two videos were located on Moodle and on the social network site to help students on this activity. The first video was concerned with the spreadsheet software in general and how to fulfil basic functions on the software. In the second video, some instructions were given on how to calculate the exam results by using formulas and functions on the spreadsheet.

When students attended to the face to face sessions, they were expected to be knowledgeable about spreadsheet software and how to make basic calculations by using formulas and functions. The duration of the videos was between 5-10 minutes length.

Second stage: Conducting the experiment

The course lasted in 13 weeks. In the first 2 weeks, the course was run in the class for all students and they were introduced with theoretical aspects of the course. The students in the experimental groups were made familiar with the Moodle. Discussions took place on FC implications in Education so as to make the students familiar with the pedagogical approach in the course.

In Week 2, the pre-test (an achievement test) was administered to the students. During the remainder of the course, an FC model was implemented. In the final week, the post-test was administered in order to measure academic success of the students. The model of the research is presented in Figure 1.

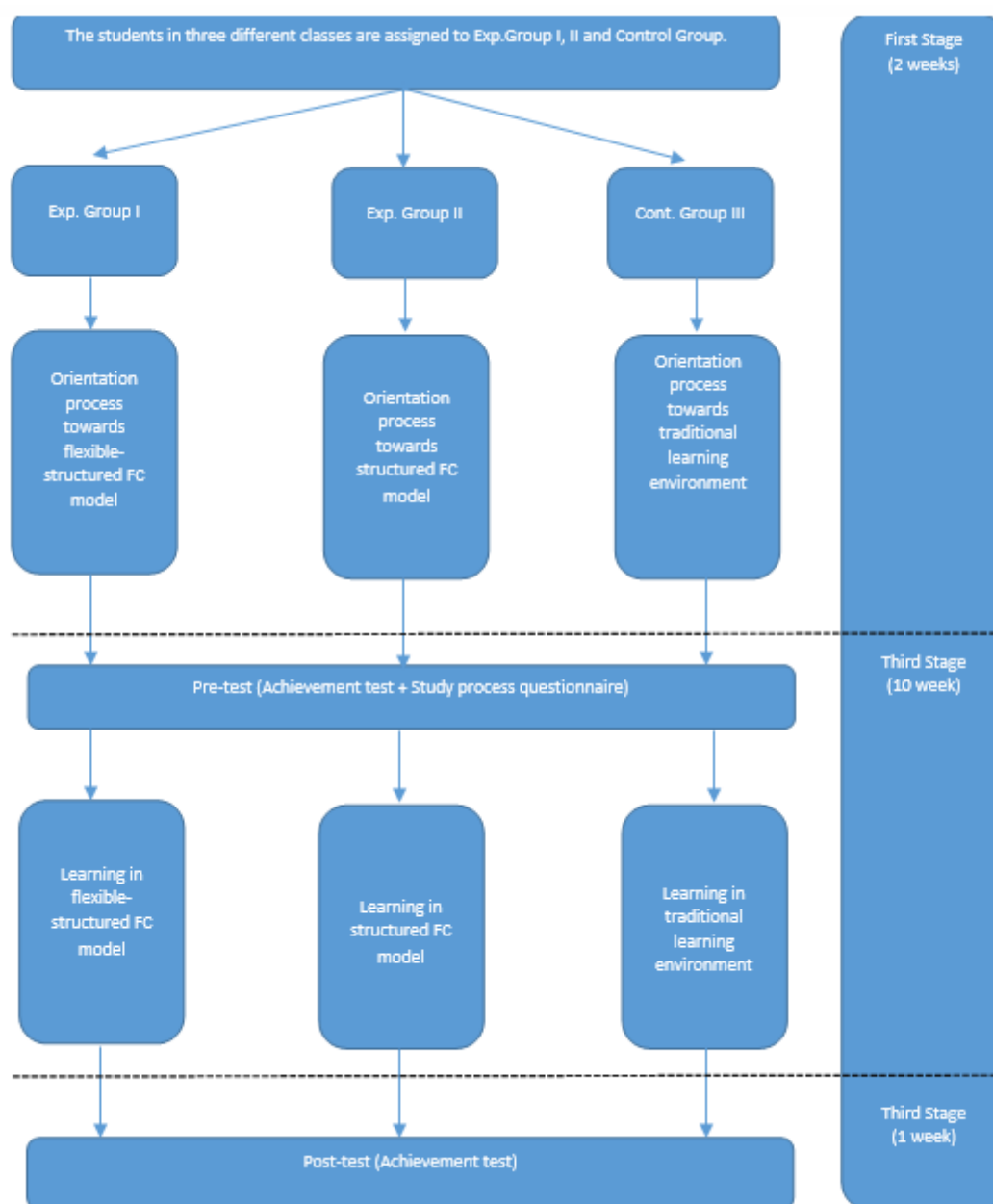


Figure 1. Procedure of the experiment

METHOD

The research was conducted as a quasi-experimental study and participants of the study consist of the students enrolled in Computing I course from 3 different teacher education departments in Turkey. The process that which department will form which group was determined randomly, in other words, students enrolled in two departments were assigned as the experimental group, while the students in the remaining department were assigned in the control group. Experimental Group I (EG I) consists of the students learning in the structured FC model in the department of Psychological Services in Education; Experimental Group II (EG II) consists of students in the flexible-structured group in the department of Elementary Mathematics Education and Control Group (CG) consists of students learning in the traditional environment in the department of Social Science Education. Quantitative data were collected via a scale and an achievement test examining the academic success of the students with different study process learning. The scales were administered online and the online system required the participants to answer all of the questions. Thus, emergence of missing data was avoided.

Instruments

A Study process questionnaire and a pre & post achievement test were used to examine the research questions. It is important to note that in order to examine academic success of the students with different learning approaches, only the students who returned both the scale and pre & post tests were taken into account (N=119). The students who did not return any of the measurement tools were excluded for this stage of analysis so as to ensure robust data analysis.

Study process questionnaire

In order to examine the students' study processes, Two Factor Study Process Questionnaire (SPQ-2F) developed by Biggs et al. (2001) was used in the research. SPQ-2F aims to identify students' learning approaches as deep and surface approaches. Yilmaz and Orhan (2011) point out that, reported by Entwistle and McCune (2004), there are a variety of instruments in the literature to measure study approaches of the students such as Inventory of Learning Processes, Learning and Study Strategies Inventory, Inventory of Learning Styles, Approaches to Studying Inventory and Study Process Questionnaire and among these instruments, Study Process Questionnaire has some advantages over the others since the questionnaire contains small number of items, it is used in different cultures, with different variables and different teaching and learning process. For these reasons, SPQ is also used in the present study.

As the participants of the present research were Turkish students, Turkish translation of the scale was administered to the participants. The scale was translated into Turkish and adapted by Yilmaz and Orhan (2011). In their study, Yilmaz and Orhan (2011) report that the 20 item-scale has two factors as deep and surface approaches and its Cronbach alpha coefficients were 0.79 and 0.73. They conclude that Turkish version of SPQ is suitable for the Turkish university students.

Achievement test

In order to measure the students' academic success, an achievement test consisting of multiple answers was developed based on the goals of the course. In the first version of the test, there were 54 items. In order to ensure its construct validity, four experts' opinions were consulted and the test was revised according to their opinions. Experts have had teaching experience on the Computing I course. Subsequently, the test was administered to the 89 second year students who have already taken Computing I course in their first year so as to ensure its validity and reliability. In investigating the internal consistency of the test, Cronbach's coefficient alpha was found 0.73. In the Table 2 below, analysis results for each item is shown based on the item's difficulty index and discrimination power.

Table 2. Item's difficulty and discrimination power on the achievement test

QN	D	P	QN	D	P	QN	D	P
Q1	0.346154	0.326923	Q19	-0.03846	0.096154	Q37	0.5	0.557692
Q2	0.115385	0.75	Q20	0.076923	0.538462	Q38	0.307692	0.423077
Q3	0.461538	0.5	Q21	0.346154	0.288462	Q39	0.346154	0.480769
Q4	0.230769	0.5	Q22	0.269231	0.173077	Q40	0.230769	0.5
Q5	0.346154	0.519231	Q23	0.076923	0.153846	Q41	0.5	0.596154
Q6	0.269231	0.365385	Q24	0.384615	0.538462	Q42	0.346154	0.673077
Q7	0.192308	0.826923	Q25	0.153846	0.423077	Q43	0.307692	0.230769
Q8	0.115385	0.865385	Q26	0.384615	0.230769	Q44	0.384615	0.346154
Q9	0.269231	0.865385	Q27	0.115385	0.134615	Q45	0.153846	0.192308
Q10	0.153846	0.384615	Q28	0.269231	0.326923	Q46	0.307692	0.653846
Q11	0.269231	0.865385	Q29	0.230769	0.153846	Q47	0.269231	0.673077
Q12	0.115385	0.711538	Q30	0.230769	0.153846	Q48	0.115385	0.288462
Q13	0.423077	0.557692	Q31	0.307692	0.230769	Q49	0.384615	0.230769
Q14	0.115385	0.519231	Q32	0.461538	0.615385	Q50	0.307692	0.538462
Q15	0.384615	0.692308	Q33	0.192308	0.25	Q51	0.307692	0.576923
Q16	0	0.153846	Q34	0.346154	0.326923	Q52	0.346154	0.673077
Q17	-0.03846	0.096154	Q35	0.384615	0.653846	Q53	0.269231	0.403846
Q18	0.269231	0.711538	Q36	0.346154	0.442308	Q54	0.192308	0.326923

QN: Question Number, p: difficulty index, d: discrimination power

The items whose item difficulty index was below .50 and discrimination power was below .30 were removed from the test. Among the remaining items, 25 items were included by taking into account of equal distribution of the course content (e.g. it was aimed to include equal number of questions on spreadsheet, word processing and presentations). The final achievement test's average score for item difficulty index was found .49 and item discrimination power was found .34.

Data analysis

Kolmogorov-Smirnov test was used in order to ensure that the scores obtained from the Study Process Questionnaire meet the assumption of normality. As a result of the test, it was found that the data demonstrated normal distribution ($p>0.05$). Therefore, ANCOVA and ANOVA tests as parametric tests were used in analysing the data. Reliability rate of .05 was taken into account in data analysis.

FINDINGS

In the scope of the study, first of all, students' study process approach was identified in the structured, flexible-structured and traditional learning environments through analysing the findings obtained from the Study Process Questionnaire. The findings are as follow;

- In Experimental Group I (EG I) consisting of the students from the Department of Psychological Services in Education, 21 out of 41 students (51.2%) adopt deep approach while 20 out of 41 students (48.8%) adopt surface learning approach.
- In Experimental Group II (EG II) consisting of students from the Department of Elementary Mathematics Education, 22 out of 40 students (55%) adopt deep learning approach while 18 of 40 students (45%) adopt surface approach.
- In Control Group (CG) consisting of students from the Department of Social Science Education, 20 out of 38 students (52.6%) adopt deep learning approach while 18 out of 38 (47.4%) adopt surface approach.

Drawing on the findings, it could be seen that the ratio of the students with deep and surface learning approach is more or less similar.

In an answer to the first hypothesis, while structured group's (EG I), flexible-structured group's (EG II), and control group's (CG) pre-test scores were stabilized, post-test scores of the groups were analysed in order to find out whether there was a significant difference between groups.

The students' post-test average scores are $\bar{x} = 80.68$ (sd=11.62) for EG I, $\bar{x} = 83.70$ (sd=7.87) for EG II and $\bar{x} = 67.05$ (sd=9.64) for CG. While students' pre-test achievement scores were taken under control, covariance analyse was used in order to analyse whether there is a significant difference between the groups' post-test scores as could be seen from Table 3.

Table 3. Covariance analysis result of the groups' post-test scores when their pre-test achievement scores are taken under control

Source of the Variance	Sum Squares	Df	Mean Square	F	Sig.	Significant Difference Between Groups
Pre-test achievement scores	822.156	1	822.156	9.062	.003	EG I-EG II EG I-CG EG II-CG
Groups	4480.125	2	2240.063	24.692	.000	
Error	10433.017	115	90.722			
Corrected Total	17352.874	118				

Table 3 shows that when pre-test scores of the groups were taken under control, there is a significant difference between the groups' post-test corrected average achievement scores [$F(2,115) = 24.692$; $p = .000 < .05$; Cohen's $f = .30$]. In order to examine the source of this difference, Bonferroni test was run. The results reveal out that there is a significant difference between EG I and EG II; EG I and CG; and EG II and CG and this shows that the most successful group based on the post-test scores are the students in EG II in the structured FC environment. Therefore, H1 hypothesis is accepted.

In an answer to the second hypothesis of the research, within the EG I and EG II groups, and CG, the students' scores were examined based on their deep and surface learning characteristics. In other words, it was aimed to examine whether there is a significant difference between the students' average scores on the post-test based on their learning approach.

Post-test achievement test average scores of the students with deep learning approach are as follow respectively; $\bar{x} = 79.43$ (sd=10.53) for EG I, $\bar{x} = 83.86$ (sd=7.81) for EG II and $\bar{x} = 67.13$ (sd=10.44) for CG. ANOVA was used to analyse whether there is a significant difference between the post-test scores of the students as could be seen in Table 4.

Table 4. ANOVA results of the post-test scores of the students with deep learning approach

Source of the Variance	Sum of Squares	df	Mean Square	F	Sig.	Significant Difference
Between Groups	3677.264	2	1838.632	20.256	.000	EG I-CG EG II-CG
Within Groups	6263.180	69	90.771			
Total	9940.444	71				

Table 4 shows that there is a significant difference between the post-test average achievement scores of the students with deep learning approach in different groups [$F(2,69) = 20.256$; $p = .000 < .05$; Cohen's $f = .61$]. In order to identify the source of this difference, Scheffe test was run. The results reveal out that there is significant difference between EG I and CG; and EG II and CG. Drawing on the findings, it was found that there is no statistically significant difference between the scores of the students with deep learning approach in structured FC learning approach and the students in the flexible-structured FC environment, while post-test scores of the students with deep learning approach in the structured FC environments are found to be higher than the students with deep learning approach in the flexible-structured FC environment and traditional learning environment. Based on these findings, H2 hypothesis is partially rejected. Accordingly, hypothesis on “The students with deep learning approach in the structured FC environment have significantly higher academic success than the students with deep learning approach in flexible-structured FC environment” was rejected. However, the assumptions about “The students with deep learning approach in the structured FC environment have significantly higher academic success than the students with deep learning approach in traditional learning environment” and “The students with deep learning approach in the flexible-structured FC environment have significantly higher academic success than the students with deep learning approach in traditional learning environment” were accepted.

In the third hypothesis of the study, in which environment the students with surface learning approach are more successful was tested. Post-test average achievement scores of the students with surface learning approach are as follow; $\bar{x} = 82.00$ (sd=12.81) for EG I, $\bar{x} = 83.33$ (sd=8.33) for EG II and $\bar{x} = 66.93$ (sd=8.61) for CG. ANOVA test was run in these groups in order to examine whether there is a significant difference in post-test average achievement scores of the students as could be seen in Table 5.

Table 5. ANOVA results of the post-test scores of the students with surface learning approach

Source of the Variance	Sum of Squares	Df	Mean Square	F	Sig.	Significant Difference
Between Groups	2488.102	2	1244.051	11.122	.000	EG I-CG EG II-CG
Within Groups	4921.600	44	111.855			
Total	7409.702	46				

Table 5 shows that there is a significant difference between the post-test average achievement scores of the students with surface learning approach in different groups [$F(2,44) = 11.122$; $p = .000 < .05$; Cohen's $f = .58$]. In order to identify the source of this difference, Scheffe test was run.

The results reveal out that there is significant difference between EG I and CG; and EG II and CG. Based on the findings, it was found that there is no statistically significant difference between the post-test scores of the students with surface learning approach in structured FC environment and the students with surface learning approach in flexible-structured environment, while post-test scores of the students with surface learning approach in the structured environment are found to be higher than the student scores with surface learning in the flexible-structured FC environment and traditional environment. Therefore, H3 was partially rejected. Accordingly, the assumption that “The students with surface learning approach in the structured FC environment have significantly higher academic success than the students with surface learning approach in flexible-structured FC environment” was rejected. However, the assumptions that “The students with surface learning approach in the structured FC environment have significantly higher academic success than the students with surface learning approach in traditional learning environment” and “The students with surface learning approach in the flexible-structured FC environment have significantly higher academic success than the students with surface learning approach in traditional learning environment” were accepted.

To sum up, quantitative analysis shows that for both deep and surface learners, there is no significant difference between EG I and EG II groups while there is significant difference between both groups and the CG. When considering the post-test average achievement scores, both experimental groups' scores are higher than the control group's scores.

DISCUSSIONS

It was revealed in the study that the students were more successful in their achievement scores in the FC model compared to the control group. This finding is consistent with the research studies adopting FC model (e.g. Danker, 2015; Davies, Dean, & Ball, 2013).

On looking at the details of the academic success of the students learning with FC model, the students achieved better in structured group (EG II) than in flexible-structured group (EG I). The results of the research are consistent with the research findings in the literature. In their research, Kanuka, Rourke and Laflamme (2007) state that for a scientifically qualified discussion, the discussion should include structured activities in which responsibilities and tasks of students are well-defined and students can provide ideas against each other's thoughts. In their research, Gilbert and Dabbagh (2005) conclude that some rules on messaging and evaluation criteria such as directive instructions, evaluation instructions and message sending instructions all positively affect meaningful discourses. In line with these findings, Fitzgerald et al. (2005) report that students are mostly satisfied with the structured environments and students want to clearly know what is expected from them. Researchers indicate that the more organised and structured the environment is, the shorter and more focused the discussions are.

In terms of individual differences of the students who adopt deep learning and surface learning approach, the present study reveals that there is no significant difference between the academic achievement scores of the students with deep and surface learning approach in structured and flexible-structured environments. As a result of the research, although the structure had no effect on learners who have deep and surface learning approaches, it was observed that the academic success of the group using structured FC environment was generally higher. Therefore, using the structure approach in designing FC environments and contents is thought to be crucial in increasing academic success.

CONCLUSIONS AND RECOMMENDATIONS TO PRACTITIONERS, DESIGNERS AND RESEARCHERS Structure in the FC models

In general, the structure provided to the FC model in this research is found to be helpful in obtaining effective learning results. On revisiting the concept of structure, Moore and Kearsley (2011) regard learning goals, content themes, teaching methods, case studies, projects, exercises and examinations as elements of a structure. In addition to these elements, Chen (2001) regards instructional materials, discussion questions, keywords bridging between the sub-topics, requirements to fulfil the tasks, resources about the units, quizzes and ideas and opinions discussed in the class as elements of a structure. Drawing on these points in the literature, the following factors could be taken into account and be clearly identified when designing an FC environment; and contents, goals and gains of the course (analysis phase), instructional contents and materials (design-development phases), educational situations (implementation phase), measurement and evaluation practices (evaluation phase).

Also, in providing a structure, it is important to divide the course into modules and organise the learning process in stages (Huang, 2002; Sandoe, 2005). At the beginning of the course, the students could be informed about the learning process and could be given a guideline and this, in turn, would help structuring the course (Moore, 1993). In this way, the students could be acknowledged about what to do in the course, better administer their learning process and some undesired situations such as facing with uncertainty and getting lost in the learning environment designed according to the FC model could be avoided (Yilmaz & Keser, 2015). This kind of structure should be given both online and face-to-face sessions of the course in the FC model.

Study process as an individual difference

On looking at the studies in the literature dealing with blended and online learning environments, there are different research outcomes about the effect of learning approaches as deep and surface learning on the academic success of the students depending on the context of the research. In their study, Ellis, Ginns and Piggott (2009) examine the relationship between academic success of the university students and their study process approach in a blended learning environment. According to the results of the study, a negative significant relationship was found between the students with surface learning approach and their academic success. In a study conducted by Buck (2008) consisting of 241 students enrolled in a physical therapy program, the effect of study process on academic success was examined. The results of the study reveal that the students with deep learning approach demonstrated higher academic success than the students with surface learning approach. However, structural equation modelling fit index which demonstrates this structure was found low in the study. In their study in a problem-based environment, Gijbels, Van de Watering, Dochy and Van den Bossche (2005) work with 133 sophomore students studying at a law school to explore the relationship between the students' approaches to learning and students' quantitative learning outcomes. The results of the study show that there is no significant relationship between students' approaches to learning and the scores they obtained from a multiple-choice questions test. McParland, Noble and Livingston (2004) report from their study that the students learning in a problem-based learning group demonstrate significantly higher examination performance than the students learning in a traditional learning group whereas impact of a learning approach on the examination scores was not identified. Snelgrove and Slater (2004; pg. 496) work with 289 nurse candidates in their first year of the study in the UK and authors examine study approaches of the students and students' academic success. The results of their study show that deep learning factor "correlated positively and significantly with grade performance average and sociology examination results" while they found a significant negative correlation between surface learning factor and nurse examination results. However, findings demonstrate a low significance level between .17 and .21. As for the relationship between the study approach and other examination results of the students, no significant relationship is found. In a study conducted by Yilmaz (2009), academic success of the participants was examined based on their learning approach in a blended learning environment. As a result of the study, it was reported that there is no significant difference found between academic success of the students and learning approach.

All these research findings regarding the learning approaches of the students and their academic success show that depending on the program, grade of education, field of instruction, students with different learning approach perform varying level of academic success. As for the results of the present study, regardless of the structure of the FC model, students are found to be more successful in the FC model than traditional learning environment. At the same time, students with surface learning approach are found to be more successful in the FC environment regardless of the structure of the FC model than in traditional learning environment. However, although the students with deep learning approach in structured FC model are found to be more successful than in the flexible-structured FC model, the difference is statistically not significant. Similarly, although the students with surface learning approach in structured FC model are found to be more successful than in the flexible-structured FC model, the difference is statistically not significant.

When considering the findings regarding both on structure of the FC model and on study process as an individual difference, research has shown that it is important to address individual differences of the learners when providing the learning environment with a structure (Moore, 1993; Lemak, Shin, Reed, & Montgomery, 2005). Also, according to Huang (2002) in order to address individual differences of the learners, there is a need to organise the learning environment in a way that enabling the students to easily access the learning materials and to engage with the learning activities. At this point, it is important to encourage the students to participate in the online discussions (Yilmaz, 2016) which could be possible with addressing reflective thinking enquiries by meeting some of their different individual learning styles (Karaoglan Yilmaz & Keser, 2016). A further point is concerned with supporting the students' collaborative learning activities in face to face session of the FC model with small number of the learning groups so as to help the students easily arrange their self-regulation behaviors in their collaborative work (Yilmaz, Karaoglan Yilmaz, & Kilic Cakmak, 2016). While assigning the students into groups for collaborative learning activities, dyads shape organisation (Noroozi, Biemans, et al., 2013; Noroozi et al., 2012; Strijbos et al., 2004) could be adopted in the face to face session of the FC model so as to provide a match between the students who adopt surface and deep learning approaches.

Overall, it was revealed in the present study that FC model was more effective in obtaining successful academic achievements in Computing I course than the traditional learning environment. Within the different levels of structure in the FC environment, the students in the structured learning environment were found to be more successful in their academic achievement scores than the students in the flexible-structured learning environment. In general, the results point out the importance of well-structured FC environments in obtaining successful learning outcomes.

Future studies and limitation of the study

The present study was carried out according to the quasi-experimental research design. While designing the control and experimental groups, first year students enrolled in Computing I course from different departments were taken into consideration. This situation has been regarded as the limitation of this research and in the future, this research can be repeated by randomly assigning students from different departments to form the control and experimental groups in experimental research studies. On the other hand, in this study, academic achievements of the students with deep or surface learning approaches in a structured and flexible-structured FC designs were compared. According to the findings obtained from the scale designed to identify study approaches of the students, it has been observed that number of students with deep and surface learning approaches in the control and experimental groups were quite identical and this situation contributes to the generalizability of this research which is carried out with regard to the quasi-experimental pattern.

Also, according to the findings in the literature, the difference between academic success of the students in a Computing course and self-efficacy perception of the teacher candidates is generated from their knowledge and experience (Torkzadeh & Koufteros 1994; Aşkar & Umay 2001). In the study by Akkoyunlu and Kurbanoglu (2003), while the computer self-efficacy of the students in the department of Computer Education and Instructional Technologies (CEIT) was identified as higher compared to those of students in other departments, there was no significant difference between other departments resulting from the differences in the departments. Moreover, according to the research, as the grade of the education increases, students tend to be more knowledgeable and experienced; thus, self-efficacy levels of teacher candidates in year 4 were considerably different compared to those of year 1 students. From this point of departure, the fact that in this research the study groups consist of the students from three programs different than CITE, and that the students have similar knowledge and experience since the length of the course is same for all groups (4 hours per week) contributes to the generalizability of the research. However, according to the previous studies (Usta & Korkmaz, 2010), it was concluded that there was no significant difference in computer success and proficiency of the teacher candidates with regard to the departments attended. In their research, Cura and Özdenir (2008) concluded that there was a significant and positive relationship between the academic achievement scores of the teachers about information and communication technologies (ICT) applications and the scores obtained from a scale measuring their attitude towards ICT. This finding leads us to assume that the attitude towards ICT implications has an effect on their academic success in a Computing course. However, according to the previous studies, it was observed that there was no significant difference between the departments other than the department of CEIT with regard to the attitude towards computer (Deniz, 1995; Kutluca & Ekici, 2010). Also this situation contributes to the generalizability of the results of this study which is carried out with regard to the quasi-experimental pattern resulting from departmental differences.

In terms of future research studies, today it is observed that the FC model approach has been used in a variety of learning institutions from universities to primary schools. In the future studies, the effectiveness of flexible-structured FC designs, which is used especially for very young students, could be examined. Furthermore, it is also experienced that FC approaches have been used in quantitative subjects such as mathematics and physics, as well as qualitative subjects such as history and literature. From this perspective, depending on the situation whether the subject is qualitative or quantitative, the flexible-structured or well-structure design of FC and the effect of deep or surface study approach on the students can be analysed. Future studies could deal with examining the most suitable learning environments for knowledge construction process when considering the existing research results (Kirschner, 2015) in regard to use of Facebook in student discussions and knowledge constructions in an FC model. As well, the effects of structured and flexible-structured environments on individual characteristics such as self-regulated learning skills could be examined in future studies.

REFERENCES

- Akkoyunlu, B., & Kurbanoglu, S. (2003). Öğretmen adaylarının bilgi okuryazarlığı ve bilgisayar öz-yeterlik algıları üzerine bir çalışma [a study on teacher candidates' perceived information literacy self-efficacy and perceived computer self-efficacy]. *Hacettepe University Journal of Education*, 24, 1-10.
- Aşkar, P., & Umay, A. (2001). İlköğretim matematik öğretmenliği öğrencilerinin bilgisayarla ilgili öz-yeterlik algısı [perceived computer self-efficacy of the students in the elementary mathematics teaching programme]. *Hacettepe University Journal of Education*, 21, 1-8.
- Beattie, V., Collins, B., & McInnes, B. (1997). Deep and surface learning: a simple or simplistic dichotomy?. *Accounting Education: An International Journal*, 6(1), 1-12.
- Bergmann, J., Overmyer, J., & Willie, B. (2012). *The flipped class: what it is and what it is not*. Retrieved from <http://www.thedailyriff.com/articles/the-flipped-class-conversation-689.php> on the 14th August 2015.
- Biggs, J.B., Kember, D., & Leung, D.Y.P. (2001). The revised two factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology*, 71, 133-149.

- Biggs, J. (2003). *Teaching for quality learning at university*. Buckingham: Society for Research into Higher Education /Open University Press.
- Bonwell, C. C., & Eison, J. A. (1991). *Active learning: creating excitement in the classroom*. Washington, DC: The George Washington University, School of Education and Human Development.
- Buck, M.E. (2008). *The association between student approaches to studying, students' evaluations of teaching effectiveness and measures of student learning*. Unpublished PhD thesis. TUI University, California.
- Cadwick, S., & Ralston, E. (2010). Perspective-taking in structured and unstructured online discussions. *International Journal of Teaching and Learning in Higher Education*, 22(1), 1-11.
- Chen, Y. J. (2001). Dimensions of transactional distance in the world wide web learning environment: A factor analysis. *British Journal of Educational Technology*, 32(4), 459-470.
- Cüre, F., & Özden, N. (2008). Öğretmenlerin bilgi ve iletişim teknolojileri (BİT) uygulama başarıları ve BİT'e yönelik tutumları [Teachers' information and communication technologies (ict) using achievements and attitudes towards ict]. *Hacettepe University Journal of Education*, 34, 41-53.
- Chen, D. (2003). Uncovering the provisos behind flexible learning. *Educational Technology & Society*, 6(2), 25-30.
- Chen, Y., Wang, Y., Kinshuk, & Chen, N.S. (2014). Is FLIP enough? or should we use the FLIPPED model instead? *Computers & Education*, 79, 16-27.
- Danker, B. (2015). Using flipped classroom approach to explore deep learning in large classrooms. *The IAFOR Journal of Education*, 3(1), 171-186.
- Davies, R. S., Dean, D. L., & Ball, N. (2013). Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. *Educational Technology Research and Development*, 61, 563-580.
- Deniz, L. (1995). Öğretmen adaylarının bilgisayar tutumları [computer attitudes of preservice teachers]. *Marmara University Journal of Educational Sciences*, 7, 51-60.
- Drennan, J., Kennedy, J., Pisarski, A. (2005). Factors affecting student attitudes toward flexible online learning in management education. *The Journal of Educational Research*, 98(6), 331-338.
- Ellis, R. A., Ginns, P., & Piggott, L. (2009). E-learning in higher education: some key aspects and their relationship to approaches to study. *Higher Education Research & Development*, 28(3), 303-318.
- Entwistle, N., & McCune, V. (2004). The Conceptual Bases of Study Strategy Inventories. *Educational Psychology Review*, 16(4), 325-345.
- Estes, M., Ingram, R., & Liu, J. C. (2014). A review of flipped classroom research, practice, and technologies. *International HETL Review*, 4(7), <https://www.hetl.org/feature-articles/a-review-of-flipped-classroom-research-practice-and-technologies>
- Garrison, D. R. & Kanuka, H. (2004). Blended learning: uncovering its transformative potential in higher education. *Internet and Higher Education*, 7, 95 - 105.
- Gijbels, D., Van de Watering, G., Dochy, F., & Van den Bossche, P. (2005). The relationship between students' approaches to learning and the assessment of learning outcomes. *European Journal of Psychology of Education*, 20(4), 327-341.
- Gilbert, P. K. & Dabbagh, N. (2005). How to structure online discussions for meaningful discourse: a case study. *British Journal of Educational Technology*, 36(1), 5-18.
- Hall, M., Ramsay, A., Raven, J. (2004). Changing the learning environment to promote deep learning approaches in first-year accounting students. *Accounting Education*, 13(4), 89-505.
- Huang, H. M. (2002). Student perceptions in an online mediated environment. *International Journal of Instructional Media*, 29(4), 405-422.
- Hughes, H. (2012). Introduction to flipping the college classroom. T. Amiel, & B.Wilson (Ed.), *Proceedings from world conference on educational multimedia, hypermedia and telecommunications* (2434-2438). Chesapeake: AACE.
- Hung, H.T. (2015) Flipping the classroom for English language learners to foster active learning. *Computer Assisted Language Learning*, 28(1), 81-96.

- James, A.J., Chin, C. K. H. & Williams, B. R. (2014). Using the flipped classroom to improve student engagement and to prepare graduates to meet maritime industry requirements: a focus on maritime education. *WMU Journal of Maritime Affairs*, 13(2), 331-343.
- Kalelioğlu, F. (2011). *Çevrimiçi tartışma yapısının öğretmen adaylarının eleştirel düşünme eğilimleri ile gerçek ve yansıyan eleştirel düşünme performanslarına etkisi [The effect of online discussion structure on pre-service teachers' critical thinking dispositions with real and reflected critical thinking performance]*. Unpublished PhD thesis, Ankara University, Ankara.
- Kanuka, H., Rourke, L. & Laflamme, E. (2007). The influence of instructional methods on the quality of online discussion. *British Journal of Educational Technology*, 38(2), 260-271.
- Karaoglan Yilmaz, F. G., & Keser, H. (2016). The impact of reflective thinking activities in e-learning: A critical review of the empirical research. *Computers & Education*, 95, 163-173.
- Kim, M. K., Kim, S. M., Khera, O. & Getman, J. (2014). The experience of three flipped classrooms in an urban university: an exploration of design principles. *Internet and Higher Education*, 22, 37-50.
- Kirschner, P. A. (2015). Facebook as learning platform: argumentation superhighway or dead-end street?. *Computers in Human Behavior*, 53, 621-625.
- Kutluca, T., & Ekici, G. (2010). Öğretmen adaylarının bilgisayar destekli eğitime ilişkin tutum ve öz-yeterlik algılarının incelenmesi [examining teacher candidates' attitudes and self-efficacy perceptions towards the computer assisted education]. *Hacettepe University Journal of Education*, 38, 177-188.
- Lemak, D., Shin, S., Reed, R., & Montgomery, J. (2005). Technology, transactional distance, and instructor effectiveness: An empirical investigation. *Academy of Management Learning and Education*, 4(2), 150-159.
- Mayer, R. E., & Moreno (2003). Nine ways to reduce cognitive load in learning from multimedia. *Educational Psychologist*, 38, 43-52.
- McParland, M., Noble, L. M., & Livingston, G. (2004). The effectiveness of problem-based learning compared to traditional teaching in undergraduate psychiatry. *Medical Education*, 38(8), 859-867.
- Moore, M. G. (1993). Theory of transactional distance. Keegan, D. (Ed.), *Theoretical principle of distance education*. Routledge.
- Moore, M. G., & Kearsley, G. (2011). *Distance education: a systems view of online learning*. Wadsworth: Cengage Learning.
- Noroozi, O., Biemans, H. J., Weinberger, A., Mulder, M., & Chizari, M. (2013). Scripting for construction of a transactive memory system in multidisciplinary CSCL environments. *Learning and Instruction*, 25, 1-12
- Noroozi, O., Weinberger, A., Biemans, H. J., Mulder, M., & Chizari, M. (2012). Argumentation-based computer supported collaborative learning (ABCSCCL): A synthesis of 15 years of research. *Educational Research Review*, 7(2), 79-106
- Salmon, G. (2004). *E-Tivities: the key to active online learning*. Kogan Page, London
- Seery, M. K., & Donnelly, R. (2012). The implementation of pre-lecture resources to reduce in-class cognitive load: A case study for higher education chemistry. *British Journal of Educational Technology*, 43(4), 667-677.
- Snelgrove, S., & Slater, J. (2003). Approaches to learning: Psychometric testing of a study process questionnaire. *Journal of Advanced Nursing*, 43(5), 496-505.
- Staker, H., & Horn, M.B. (2012). *Classifying K-12 blended learning* (White Paper). San Mateo, CA: Clayton: Christensen Institute.
- Strijbos, J. W., Martens, R. L., & Jochems, W. M. G. (2004). Designing for interaction: Six steps to designing computer-supported group-based learning. *Computers and Education*, 42(4), 403-424.
- Torkzadeh, G., & Koufteros, X. (1994). Factorial validity of a computer self-efficacy scale and the impact of computer training. *Educational and Psychological Measurement*, 54, 813-813.
- Turan, Z. (2015). *The Evaluation of Flipped Classroom Method and Examination of its Effects on Academic Achievement, Cognitive Load and Motivation*. Unpublished PhD Thesis. Ataturk University, Turkey.
- Wilson, K., Fowler, J. (2005). Assessing the impact of learning environments on students' approaches to learning: comparing conditional and action learning designs. *Assessment & Evaluation in Higher Education*, 30(1), 87-101.

- Usta, E., & Korkmaz, Ö. (2010). Öğretmen adaylarının bilgisayar yeterlikleri ve teknoloji kullanımına ilişkin algıları ile öğretmenlik mesleğine yönelik tutumları [Pre-service teachers' computer competencies, perception of technology use and attitudes toward teaching career]. *Journal of Human Sciences*, 7(1), 1335-1349.
- Yılmaz, B. (2009). *Karma öğrenme ortamındaki üniversite öğrencilerinin öğrenme yaklaşımlarına göre ders başarılarının, derse devamlarının, web materyalini kullanma davranışlarının ve ortama yönelik memnuniyetlerinin değerlendirilmesi* [Evaluation of university students academic achievements, attendances, web material using behaviours, and satisfactions with the learning environment according to their learning approaches in a blended learning environment]. Unpublished PhD thesis. Yıldız Technical University, İstanbul.
- Yılmaz, B. & Orhan, F. (2011). Ders çalışma yaklaşımı ölçeği'nin türkçe formunun geçerlik ve güvenirlik çalışması [The validity and reliability study of the Turkish version of the study process questionnaire]. *Education and Science*, 36, 159, 69-83.
- Yılmaz, R., & Kılıç-Çakmak, E. (2012). Educational interface agents as social models to influence learner achievement, attitude and retention of learning. *Computers & Education*, 59(2), 828-838.
- Yılmaz, R. (2014). *Çevrimiçi öğrenmede etkileşim ortamının ve üstbilişsel rehberliğin akademik başarı, üstbilişsel farkındalık ve işlemsel uzaklığa etkisi* [The effect of interaction environment and metacognitive guidance in online learning on academic success, metacognitive awareness and transactional distance]. Unpublished PhD thesis. Ankara University, Ankara.
- Yılmaz, R., & Keser, H. (2015). İşlemsel uzaklık algısı ve uzaktan eğitim uygulamalarına yansımaları [Transactional distance perception and its reflections on distance education practices]. *Ankara University Journal of Faculty of Educational Sciences*, 48(2), 37-59.
- Yılmaz, R. (2016). Knowledge sharing behaviors in e-learning community: Exploring the role of academic self-efficacy and sense of community. *Computers in Human Behavior*, 63, 373-382.
- Yılmaz, R., Karaoglan Yılmaz, F. G., & Kilic Cakmak, E. (2016). The impact of transactive memory system and interaction platform in collaborative knowledge construction on social presence and self-regulation. *Interactive Learning Environments*, 1-21. DOI: 10.1080/10494820.2016.1224905
- Zheng, R. Z., Flygare, J. A., & Dahl, L. B. (2009). Style Matching or Ability Building? An Empirical Study on FD Learners' Learning in Well-Structured and Ill-Structured Asynchronous Online Learning Environments. *Journal of Educational Computing Research*, 41(2) 195-226.

The Effects of Smartphone Addiction Marital Adjustment of Partners*

Hatice KUMCAĞIZ

*Ondokuz Mayıs University
Samsun, Turkey
haticek@omu.edu.tr*

Cengiz ŞAHİN

*Ahi Evran University
Kirsehir, Turkey
csahin@ahievran.edu.tr*

Berna KÖKSAL

*Ondokuz Mayıs University
Samsun, Turkey*

ABSTRACT

The purpose of this study is to examine the role of smartphone dependency in communication conflicts between partners during marital adjustment. The study sample consisted of 428 married family physicians and health care workers working at Samsun Public Health Directorate in January and February, 2017. The Smartphone Dependency Scale and the Marital Satisfaction Scale were used as data collection instruments of the study. The data was analyzed using the relational scanning model, which is designed to describe the current situation. The independent variable of the study was smartphone usage levels of married individuals while the dependent variable was marital adjustment. The average age of the participants was 40.46. The data was analyzed using correlation and regression analysis methods. To the study findings, there was not a specific smartphone dependency amongst the participating health care workers, but still they experienced problems in marital adjustment. There was an inverse, weak and negative relation between marital adjustment and smartphone dependency ($p=0.006$, correlation coefficient -0.133) and there was a positive relation between smartphone dependency and age. As the study results indicated, the scores from the Smartphone Dependency Scale were seen to differ in terms of age and gender. Also, the communication conflicts between partners about smartphone dependency played a negative role in marital adjustment.

Key Words: Married individual, Smartphone dependency, marital adjustment.

INTRODUCTION

Smartphones are widely used to gain access to information and applications, and to achieve higher profits (ITPC, 2011). Besides, the convenience they brought to our lives, the Smartphone can cause serious physical and psychological damage as a result of misuse. There are many problems such as concentration disorders, replacement of face-to-face communication by non-verbal communication, sociopathy, faulty marriages due to easy communication, and private life becoming accessible by everyone (Ünal, 2015).

Since the smart phones are part of everyday life, they also cause some problems. Although there is no clear definition in the psychiatric world yet, Smartphone addiction has become an important research and debate issue as a type of addiction that develops due to the frequency of Smartphone usage (Kuyucu, 2017).

In order to express phone usage as an addiction, it is necessary for the person to spend daily life activities at all times on the phone. When the person chooses the activity that is appropriate for his or her situation, it is mostly oriented towards Smartphone usage. If the Smartphone provides happiness in addition to providing convenience to the life of the person after using it, it causes the behavior to repeat itself and the person become dependent on it. The person can express himself/herself by using social media or communication tools via Smartphone and can communicate with everyone more comfortably. In this way, he/she can easily share the problems with the person he/she desires. Thus, the individual can easily share his/her feelings and thoughts with others (Özbek et al., 2014; Yilmaz, 2015).

* This work was supported by the Ahi Evran University Scientific Research Projects Coordination Unit. Project Number:EGT.A4.17.018

In this way, it has been seen that 53% of the people who had addiction problems had a problem with their children-parents and wives (Young 2004). In addition, addiction and the desire to be in a constantly virtual environment often distract couples from the other (Bensghir and Altinok, 2005).

Marriage is not a relationship which only gains the consent of the community and ensures the sexual satisfaction of spouses. Marriage is a universal institution composed of interconnected systems in which two people come together in a permanent partnership and start a family and maintain the continuity of the generation, promise to fulfill their common responsibilities towards each other, their children and the society (Saxton, 1982). In this respect, the adjustment of married individuals is a very complicated social structure in terms of the happiness of the spouses with different personality, the sexual satisfaction of the spouses, the raising of the children, the relationship of each spouse with their family and the relationship with the living-working environment.

The adjustment of spouses is not only important in deciding whether to marry, but is closely related with the ability to adapting the changing circumstances in life. According to Spanier (1976), the marital adjustment; "Spouses must adapt to everyday life and changing living conditions and the change of the spouses within a certain time" (Spanier, 1976). It is stated that marital adjustment is important in the stages of development and maintenance of the marriage, and it is stated that it could be possible when one of the spouse dies in the termination stage (Turgut, 2014). It is observed that individuals have moved away from each other with developing technology because they cannot express their emotions and thoughts in the marriage process sufficiently and cannot communicate with each other. It is inevitable to experience social and cultural changes when technological developments and communication instruments are rapidly developed and spread in our era. As a consequence of cultural, social and economic changes, family life is changing and becoming more complex in relation to child parental relations and spousal relationships.

Marriages that are able to interact with each other, can form consensus on the problems encountered in the marriage process and solve the problems in a moderate and positive manner are defined as well-adjusted marriages (Erbek et al., 2005). Individuals who can express themselves are said to be effective in communication, and marital cohesion in marriages is effective (Waring and Chelune, 1983). In a study conducted in Turkey; emphasized the psychological effects of marital adjustment on children and identified that the children were negatively affected (Erbek et al., 2005).

Marital adjustment has become one of the most important issues in recent times. Marital cohesion is the most important factor affecting togetherness concludes in marriage or the continuation of post-marriage family structure. As the adjustment increases in marriage, conflict decreases divisions and divorce decrease, however marital satisfaction of individuals increases.

Industrialization and technological developments, accelerated living conditions also affect the concept of marriage and family structure. Along with the changing society and social values, the family structure changes and causes contradictions, generational conflicts with traditional family structure. In addition to this, the spouses' financial status, education level, age, etc. are influential on marital adjustment. Verbal violence of women and men during marriage is one of the factors that cause marriage adjustment to fail on the first anniversary of marriage (Erbek et al., 2005). A good marriage can exist with a good adjustment. This can be through effective communication and depends on an effective marriage satisfaction.

Although there are a large number of studies in the literature about the factors affecting Smartphone use (Ada and Tatlı, 2012; Park and Chen, 2007; Bodker vd. 2009; Ay, 2013, Bayraktutan, 2005), the majority of these studies are aimed at general use. Smartphones, which provide a lot of ease of use along with the developing technology, have entered our homes and even into our rooms. In addition to providing ease of use, some problems have emerged along with integration of cultural structure with society-family values (Demir, 2016). It is thought that the family structure which comes from the past to the present day is adversely affected by this process due to a number of changes with the development of technology. In recent years, it has been seen that the use of smart phones is increased among individuals. It is very important to carry out awareness studies in order to be able to prevent this problem in the early period and to prevent it before negative effects occur. It is known that Smartphone usage is more common in some occupational groups. It has been observed that the use of smart phones is more prevalent in medical personnel due to their profession. In this context, in this study, since it is thought that the use of smart phone in family physicians and family health workers affiliated to Samsun Public

Health Directorate is common, it is assumed that the examination of the relationship between marital conflicts and problems of married couples with the use of smart phone will play an effective and important role in the experienced domestic conflicts.

The Purpose of Research

The general purpose of this research; is to examine married people's Smartphone addiction and accordingly the role of this addiction in marital adjustment. In response to this general objective, the following questions were sought.

1. What is marital adjustment level of married individual's Smartphone addiction?
2. Is there a meaningful relationship between marital adjustment and Smartphone addiction of married individuals?
3. Is there a significant relationship between marital adjustment and Smartphone addiction according to the genders of married individuals?
4. Are Smartphone addiction and perceived economic income in married individuals predictive of marital adjustment?

METHOD

In this section, research model, universe and sample, data collection tools, data collection techniques and data analysis and interpretation methods are explained.

Research Model

This study was designed by cross-sectional screening from general screening models. Variables to be described in cross-sectional studies, in which the sample is usually very large and consists of many different characteristics, are measured in one go (Büyükoztürk, et al., 2014).

Universe and Sampling

The research universe compose of 744 married health personnel, including 386 family physicians and 358 family health workers, who provide Primary Protective Health Care at Samsun Public Health Directorate between 01.01.2017-01.06.2017. The sample groups consisted of 428 married health personnel, 272 (63.5%) female and 156 (36.5%) male volunteers and were able to reach from the research universe.

The married individuals participating in the survey have a mean age of 40.46 (SS.8.11) and an age range of 21-65. It was found that 63 of the participants were graduated from high school (14.7%), 96 were graduated with associate degree (37.1%), 178 (78.7%) with bachelor's degree and 91 (21.3) with masters degree; 108(25,2) have 1 child, 220 (51.4) have 2 children, 44 (10.3) have three children and above, and 56 (13.1%) have no children. 182(42.5%) married individuals stated that they were very satisfied with their profession, 175 (40.9%) were slightly satisfied, 50 (11.7%) were indecisive and 21 (4.9%) were not satisfied; it has been observed that 234 (54.7%) chose profession by their own volition, 108 (25.2%) by family request, 65 (15.2%) by job opportunity and 21 (4.9%) by other reasons. 16 (3.7%) married individual reported that they found their average monthly income on low level, 315 (73.6%) found on intermediate level and 97 (22.7%) high level.

Data Collection Tools

Research data were collected by using the Smart Phone Addiction Scale Short Form and Marital Adjustment Scale.

The Smartphone Addiction Scale (SAS-SF): It is a measure, which developed to measure Smartphone addiction risk by Kwon et al. (2013), consists of 10 items and evaluated with Likert six point scales. The adaptation work in Turkish was done by Noyan et al. (1915). The Chronbach alpha coefficient, which indicates the reliability of the SAS-SF, was measured as 0.86. The test / retest reliability coefficient is 0.92. The internal consistency coefficient of the scale used in this study is .90.

Marital Adjustment Scale (MAS): The Marital Adjustment Scale (MAS) developed by Locke and Wallace (1959) and adapted to Turkish by Tutarel-Kışlak (1999). It was used to measure the validity and reliability of the marriage adjustment scale. The internal consistency coefficient of the MAS was .90. The reliability of the two split-half measures of the scale was .85 and .78. The internal consistency coefficient of the scale used in this study is determined as 81.

Procedure

Prior to the research, necessary permissions were obtained from Samsun Public Health Directorate and Ondokuz Mayıs University Social and Humanities Ethics Committee (Decision no: 2016-164). Participants were visited at workplaces and informed about the purpose of the research, and after verbal approvals, they were asked to fill the measurement tools of the married individuals by paying attention to the principle of volunteerism and confidentiality. The application lasted approximately 20-25 minutes.

Data Analysis

The research was conducted with a relational screening model to describe the current situation. The independent variables of the study are the level of married individuals' Smartphone usage and the dependent variables are the marital adjustment. When the data obtained from the study evaluated by the Kolmogorov-Smirnov test to assess whether the data shows normal distribution or does not. It was determined that the level of Smartphone dependency and marital adjustment scores did not show normal distribution ($p < 0.05$). In this context, Spearman Correlation Analysis and Linear Regression Analysis were used in the analysis of data. Statistical procedures SPSS 21.0 program was used and the confidence level was taken as 95%. Significance level was calculated at $p < 0.05$.

FINDINGS

In this section, analyzes on the findings obtained through research are presented.

Findings of Married Individuals on Smartphone Addiction and Marriage Adjustment Levels

Table 1 shows the sub-descriptive characteristics of married individual's Smartphone addiction and marital adjustment levels of married individuals.

Table 1. Descriptive statistics on Smartphone addiction and marital adjustment levels

Variable	N	Minimum	Maximum	Average	Standard Deviation
Smartphone addiction	428	10	60	21.07	9.618
Marital adjustment	428	4	55	41.28	7.119

In Table 1, it is seen that the married individual's average telephone addiction point is $X = 21.07$ and that of marriage adjustment point is $X = 41.28$. Referring to Smartphone addiction, the result of the applied scale was found to be 21.07. As a result, it has become clear that there is no Smartphone addiction among family health workers and family physicians who work in primary health care with intense work pressure.

The result of the study on marriage adjustment was 41. According to this result, it can be said that the married individuals, who participated in the study, have experienced adjustment problems.

Findings on Married Individuals' Smartphone Addiction and Marital Adjustment

Spearman correlation analysis was performed to determine whether there was a meaningful relationship between Smartphone addiction of married individuals and marital adjustment. The results are given in Table 2.

Table 2. Spearman correlation analysis showing the relationship between participant's Smartphone addiction and marital adjustment

		Marital adjustment	Smartphone addiction
Marital adjustment	Correlation coefficient	1.000	-.133**
	p value	.006	
	N	428	428
Smartphone addiction	Correlation coefficient	-.133**	1.000
	p value	.006	
	N	428	428

Table 2 shows that marriage adjustment is decreased as participants' Smartphone addiction increased. There is a weak adverse negative correlation between marital adjustment and Smartphone addiction ($p = 0.006$, correlation coefficient = -0.133).

Findings on Smartphone Use and Correlation between Marital Adjustment and Gender Variable

In the research, Spearman correlation analysis was used to examine the relationship between gender variable, Smartphone use and marital adjustment. The conducted analysis revealed that marital adjustment decreased as the Smartphone addiction of males increased ($r = -.175$; $p = .029$), where as there was no change detected in females ($p = .144$).

Findings on the variables related to Marital Adjustment Prediction

Table 3 shows the results of simple linear regression analysis of whether married individuals have predicted Smartphone addiction and marital adjustment of perceived economic status.

Table 3. The simple linear regression analysis results of predicting marital adjustment

Variable		Non-standard variables		Standard Variables	t	p
		B	Std. Error	B		
1	Marital adjustment	42.733	.661		64.651	.000
	Smartphone addiction	-.753	.289	-.126	-2.607	.009
2	Marital adjustment	39.464	1.697		23.255	.000
	Smartphone addiction	-.752	.288	-.125	-2.614	.009
	Perceived income	1.492	.714	.100	2.090	.037

In Table 3, it has been observed that when telephone addiction decreased, adjustment increased, and also adjustment proportionally increased as perceived income level increased, ($p < 0.05$).

CONCLUSION AND DISCUSSION

The results of the study show that there is a weak adverse negative correlation between marital adjustment and Smartphone addiction in health workers, as the telephone addiction increases in males, marital adjustment proportionally decreases where as there is no change in females, it is observed that adjustment increased when the telephone addiction decreases, also adjustment proportionally increased as perceived income level increased. When the literature was examined, it was not possible to find a study that examined Smartphone addiction of married individuals and consequently its role in marital adjustment. For this reason, the results of the research are discussed according to the results obtained from studies on marital adjustment and Smartphone addiction.

When the research findings are examined, it is found out that there is no Smartphone addiction in health personnel and family physicians within the scope of the research. It is stated in the literature that Smartphone addiction is related to the users' level of income and the quality of the phone they have (Kuyucu, 2017), indicating that the prospective teachers' level of Smartphone addiction has a moderate level (Çalışkan et al., 2017). It is seen that the research findings do not overlap with the literature.

Average marital adjustment score of married individuals participating in the survey was 41. According to the Marital Adjustment Scale adapted to Turkish by Tutarel-Kışlak (1999), the ones who score above 43 points are evaluated as compatible and the ones who score below 43 points are evaluated as incompatible. According to this, they obtained score is slightly below 43% of the average score but it can be said that it is not a very bad value regarding marriage adjustment.

As the Smartphone addiction of participants in the research increased, marriage adjustment decreased. There is an adverse negative relationship between marital adjustment and Smartphone addiction. There are also studies that reveal contradictory findings. Park and Chen (2007) investigated the use of smartphones by doctors and nurses; found that using smartphones had a positive effect on marital adjustment. Factors such as social environment, living conditions, causes and occupation can be considered as factors affecting the relationship between Smartphone addiction and marital adjustment.

In this study, it has seen that according to gender variable, as the phone addiction increases in males, marriage adjustment decreases proportionally and there is no change in females. Different results have been reached about this subject in the literature. Similar results were obtained in Şendil and Kızıldağ (2004) studies. On the contrary, there were also studies in which the scores of spouse adjustment scores have not become different in terms of gender (Şendil and Korkut, 2008, Çelik, 2006, Günay, 2007). It can be said that the research findings are partially supported by the literature. According to this result, it can be said that in the Smartphone dependency, the gender variable alone is not effective solely and there may be other variables which affect the addiction as well as the gender.

According to another finding of the research, marriage adjustment increased when the Smartphone addiction decreased, and also adjustment proportionally increased as perceived income level increased. When the literature is examined, it is indicated that the individuals with low economic status have low couple adjustment and relationship with respect to the ones with better economic status (Bradbury et al., 2000; Şendil and Korkut, 2008). It is seen that the research findings overlap with the literature. According to this, it can be said that effective communication in marital adjustment is important and at the same time, inadequacy of economic situation may affect marital adjustment negatively.

As in every study, there are some limitations of this study. Participants of the study are family physicians and family health workers who work at primary health service affiliated to Samsun Public Health Directorate. This situation prevents the obtained results being generalized to individuals working in different cities of Turkey. Research is limited to responses to the Smartphone Addiction and Marital Adjustment Scale.

The following suggestions were made in the light of the results obtained from the research. The research found that there is an adverse and significant relationship between marital adjustment and Smartphone addiction. According to this result it is thought that it will be important to address psycho-education programs which aim to improve marital adjustment and communication skills in marital therapies. It is also recommended that qualitative studies be conducted in order to examine the results of the research in depth.

REFERENCES

- Ada, S., & Tatlı, S.H. (2012). Akıllı telefon kullanımını etkileyen faktörler üzerine bir araştırma. Kahramanmaraş Sütçü İmam Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, İşletme Bölümü, Kahramanmaraş. <http://ab.org.tr/ab13/bildiri/74.pdf>. 1-8. Erişim tarihi: 07.06.2017.
- Ay, S. (2013). İletişim araçları kullanımının yarattığı bağımlılığın sosyal izolasyon üzerindeki etkisi, cep telefonu kullanıcıları üzerinde bir çalışma. *İdari Uzmanlık Tezi*, Bilgi Teknolojileri ve İletişim Kurumu, İzmir.
- Bayraktutan, F. (2005). Aile içi ilişkiler açısından internet kullanımı. *Yayımlanmamış Yüksek Lisans Tezi*, İstanbul Üniversitesi, Sosyal Bilimler Enstitüsü, İstanbul.

- Bensghir, T.K., & Altınok, R. (2005). *Bir iletişim aracı olarak internetin aile içi ilişkilere etkileri: Türkiye'de devletin ve ailenin konuya bakışı. Günümüzde Aile, Uluslararası Aile Sempozyumu*, 02-04 Aralık 2005, İstanbul.
- Bodker, M., Gimpel, G., & Hedman, J. (2009). *The user experience of smart phones: A consumption values approach. 8th Global Mobility Roundtable*, Cairo, Egypt.
- Bradbury, T.N., Fincham, F.D., & Beach, S.H.R. (2000). Research on the nature and determinants of the marital satisfaction :a decade in review. *Journal of Marriage and Family*, 62, 964-980.
- Büyükoztürk, Ş., Kılıç Çakmak, E., Akgün, Ö.E., Karadeniz, Ş., & Demirel, F. (2014). *Bilimsel Araştırma Yöntemleri*, Ankara : Pegem Akademi.
- Çalışkan, N., Yalçın, O., Aydın, M., & Ayık, A. (2017). BÖTE öğretmen adaylarının akıllı telefon bağımlılık düzeylerini belirlemeye yönelik bir çalışma. *International Journal of Eurasia Social Science*, 8(26), 111-125.
- Çelik, M. (2006). Evlilik doyum ölçeği geliştirme çalışması. *Yayımlanmamış Yüksek Lisans Tezi*, Çukurova Üniversitesi, Sosyal Bilimler Enstitüsü, Adana.
- Demir, Ü. (2016). Sosyal medya kullanımı ve aile iletişimi: Çanakkale'de lise öğrencileri üzerine bir araştırma. *Selçuk Üniversitesi İletişim Fakültesi Dergisi*, 9 (2), 27-50.
- Erbek, E., Beştepe, E., Akar, H., Eradamlar, N., & Alpkan R.L. (2005). Evlilik uyumu. *Düşünen Adam*, 18(1),39-47.
- Günay, S.(2007). Evlilik çatışması, nedensellik-sorunlulukyüklemeleri, eşlerin evlilik ilişkisinden sağladıkları genel doyuma ilişkin görüşleri ve evliliğe ilişkin değerlendirmeler arasındaki ilişkiler. *Yayımlanmamış Yüksek Lisans Tezi*, Ankara Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara.
- ITPC Policy Compliance Group, Managing the Benefits and Risks of Mobile Computing, Aralık (2011), <http://www.isaca.org/KnowledgeCenter/Documents/Managing-the-Benefitsand-Risks-of-Mobile-Computing-ITPCGDec2011.pdf>, Erişim tarihi: 23.06.2017.
- Kuyucu, M. (2017). Gençlerde akıllı telefon kullanımı ve akıllı telefon bağımlılığı sorunsalı: akıllı telefon(kolik) üniversite gençliği. *Global Media Journal TR Edition*, 7(14), 328-359.
- Locke, H.J., & Wallace, K.M. (1959). Short marital -adjustment and rediction tests: Their reliability and validity. *Marriage and Family Living*, 21, 251-255.
- Noyan, C.O., Darçın A.E., Nurmedov, S., Yılmaz, O., & Dilbaz, N. (2015). Akıllı telefon bağımlılığı ölçeği'nin kısa formunun üniversite öğrencilerinde Türkçe geçerlilik ve güvenilirlik çalışması. *Anadolu Psikiyatri Dergisi* (Özel sayı.1), 16, 73-78.
- Özbek, V., Alniaçık, Ü., Koç, F., Akkılıç, M.E., & Kaş, E. (2014). Kişilik özelliklerinin teknoloji kabulü üzerindeki doğrudan ve dolaylı etkileri: Akıllı telefon teknolojileri üzerine bir araştırma. *Intenational Review of Economics and Management*, 2 (1), 36-57.
- Park, P.,& Chen, J. V. (2007). Acceptance and adoption of the innovative use of smartphone. *Industrial Management & Data Systems*, 107(9), 1349 -1365.
- Saxton, L. (1982). *Marriage. the nature of marriage, the individual, marriage, and the family*. (5.Edith). California, Wadsworth Publishing Company Belmont, A Division of Wadswort, Inc. 216-224.
- Spanier, G.B. (1976). Measuring dyadic adjustment: new scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*, 38,15-28.
- Şendil, G., & Korkut, Y. (2008). Evli çiftlerdeki çift uyumu ve evlilik çatışmasının demografik özellikler açısından incelenmesi. *Psikoloji Çalışmaları*, 28, 15-34.
- Şendil, G., & Kızıldağ, Ö. (2004). Çocuk ve ergenlerde ebeveyn evlilik çatışma algısı. *Çocuk ve Gençlik Ruh Sağlığı Dergisi*, 10, 58-66.
- Turgut, M. (2014). Türkiye'de boşanma nedenleri araştırması TBNA 2014. Aile ve Sosyal Politikalar Bakanlığı, Aile ve Toplum Hizmetleri Genel Müdürlüğü, Ankara.
- Tutarel-Kışlak,,Ş. (1999). Evlilikte uyum ölçeğinin (EUÖ) güvenilirlik ve geçerlik çalışması. *3P Dergisi*, 7(1), 50-57.
- Kwon, M., Kim, D.J., Cho, H., & Yang, S. (2013) The Smartphone Addiction Scale: Development and Validation of a Short Version for Adolescents. *PLoS ONE* 8(12), e83558. <https://doi.org/10.1371/journal.pone.0083558>

- Ünal, M.H.(2015). Ankara Yıldırım Beyazıt Üniversitesi Tıp Fakültesi öğrencilerinin akıllı telefon bağımlılık düzeylerinin belirlenmesi. Yayınlanmamış Uzmanlık Tezi, Sağlık Bakanlığı, Yıldırım Beyazıt Üniversitesi Tıp Fakültesi, Aile Hekimliği Anabilim Dalı.
- Waring, E.M., & Chelune, G.J.(1983) Marital intimacy and self disclosure. *Journal of Clinical Psychology*, 39, 183-189.
- Yılmaz, G. (2015).Ergenlerde Mobil telefon Bağımlılığının Sosyal Anksiyeteye Etkisinin Bazı Değişkenlere Göre İncelenmesi. Yayınlanmamış Yüksek Lisans Tezi, Nişantaşı Üniversitesi, Sosyal Bilimler Enstitüsü, İstanbul.
- Young, K.S. (2004). İnternet addiction a new clinical phenomenon and its consequences, *American Behavioral Scientist*, 48(4), 402-415.

The Impact of Assistive Technology on Down Syndrome Students in Kingdom of Bahrain

Jaflah ALAMMARY

*College of Information Technology
University of Bahrain
Kingdom of Bahrain
jafuob@gmail.com*

Fatima AL-HAIKI

*College of Information Technology
University of Bahrain
Kingdom of Bahrain*

Kawther AL-MUQAHWI

*College of Information Technology
University of Bahrain
Kingdom of Bahrain*

ABSTRACT

Assistive Technology is playing an enabler role in the life of Dawn Syndrome. Assistive Technology can allow Down Syndrome to engage in the normal life activities and be more social and independent. The Arab countries are providing vital effort on facilitating the life of Dawn Syndrome and encouraging their engagement in normal social life. However, there is a lack in utilizing Assistive Technology in supporting such segment of people in these countries. The main aim of the current research is to investigate the current situation regarding the adoption of AT in the teaching and learning processes of Down Syndrome students in inclusion schools and rehabilitation centers in Kingdom of Bahrain. In addition, the impacts of AT in enhancing the independence, performance and social interaction of Down Syndrome students were examined. To achieve these objectives, two different questionnaires were administered to a non-random sample of teachers or specialists and families of Down Syndrome at Kingdom of Bahrain. In general the results show that the adoption of AT in teaching and learning of Down Syndrome students can enable them to be more social and independent person. AT can enhance the Down Syndrome communication which in turn can improve their independence, social interaction, and performance. However, to perceived the greatest and sustainable advantage on using AT, there is still a need for enhancing the capabilities and skills of the teachers/specialists and families to be able to adopt the AT for getting the best results. The research outcomes address several recommendations to enhance the educational process for the Down Syndrome students and other disabled people in Kingdom of Bahrain. Moreover, the study has a vital contribution to the theoretical literature and knowledge by building new model for examining the impact of AT on the Down Syndrome which is rarely develop by previous literature. In addition, it has developed new measurements which can be adopted in further studies in the same field.

INTRODUCTION

Information and Communication Technology ICT and Assistive Technology (AT) is considered as an effective learning tools that can help in improving and developing social skills as well as academic achievement and enable Dawn Syndrome (DS) is increasing their abilities to cope with the rapid progression life (Ahmed, 2015; Lahm, 2002). AT offer new opportunities for everyone, but for DS these opportunities are more significant as they can use AT for their daily activities to a higher extent than other normal people (Ahamed, 2015). That's means disabled individuals are able to participate in all aspect of social life on more equal terms than ever before. AT enables DS to communicate with others, involve in the social activities and be effective part in their communities that they would be unable to do without technology (Cowan and Khan, 2005).

Despite the vital concern devoted for the DS and other disabled people in the Arab countries, there is still a lack in utilizing Information Technology (IT) for supporting such segment of people. Few number of researches have been conducted to study the role and the impact of AT on disabled people. Therefore, the current research is aimed to answer a main question of *“To what extent AT enables DS students to be independent and engage in normal life at Kingdom of Bahrain?”* The main objective of the current study is set to be investigating the current situation regarding the adaption of AT in the learning process of DS students in inclusion schools and rehabilitation centers. This will be tackled from the following aspects: problems and challenges facing DS student which are caused by their special features or disabilities and to what extent this difficulties are impacting their teaching and learning process, and types of AT that are adopted by inclusion schools and rehabilitation centers for the learning and teaching processes. In addition the study will examine the impacts of AT in enhancing the independence, performance and social interaction of DS students.

The current research is considered as one of the few and significant studies in the field of AT and the learning of special needs. The study is tackled a vital issue concerning the Arab world which is the engagement of DS students in an effective learning environment and normal social life. As a social implication for the study, the findings would help in enhancing the awareness toward the special needs people and especially the DS and how they can be an active factor in the society. More attention will be paid by the decision makers and educators in the Kingdom of Bahrain toward the effect of AT in supporting the DS students and enhancing their achievement. As such, the study will provide information on the different types of AT that can be adopted in the learning of DS and how each type can support different disabilities and challenges for DS which need to be considered by management and academic staff in the inclusion schools and rehabilitation centers. As a theoretical implication, the current study will enrich the theoretical literature on the field of AT and DS in the context of the Arab countries as well as developing new model on the impact of AT on DS performance, independence and social interaction which rarely undertaken by previous studies. Moreover, the study provides new measurements that can be further used and developed in new studies in the same field.

The current paper is articulated into seven sections including the introduction. AT impact on DS students and AT in the Arabian Gulf Countries and Kingdom of Bahrain were discussed in the next two sections. The research and hypotheses were discussed in the Section 4. Section 5 discusses the research methodology and data collection. Section 6 presents the data analysis and results of the research. The paper then concludes with Section 7.

ASSISTIVE TECHNOLOGY IMPACT ON DOWN SYNDROME STUDENTS

DS is a set of physical and mental tracks which is caused as a result of a chromosomal disorder (Al-Edwan, 2015). Normally a person has 46 chromosomes; while DS determined by 47 chromosomes (Percy and Schormans, 2006). This extra genetic material alters the course of development (Al-Edwan, 2015) and causes diverse impairments such as visual, hearing, cognitive, motor and communication (Feng et al, 2008). Therefore, individuals with DS have varying degrees of abilities, skills, behavior and physical development. However, DS learning deficits result from different learning styles rather than learning impediments (Alfaraj and Kuyini, 201). DS people have a numerous disability appear as physical and cognitive characteristics that need to be identified serious attention and helpfulness when it comes to their education or other aspects of their life (Faragher and Brown, 2005; Alfaraj and Kuyini, 2014). As a general rule, students with DS need activities that are highly structured and sequenced, small amounts of information presented at a time and a good reward system (DASWM, 2015).

AT are a powerful tools for improving the participation and engagements of disabled people in their learning process (Gierrach and Stindt, 2009; McKnight and Davies, 2013). AT is defined as the equipment, devices, services, systems, processes that aim to help the disabled persons with special educational needs to better function in daily life, attain a higher quality of life and secure their full, active and easy participation in society (Lancioni et al., 2013, Hersh and Johnson, 2008). Moreover, the International Classification of Functioning, Disability and Health (ICF) define the assistive products or technologies as any product, instrument, equipment or technology that are specially designed for improving the functionality of a person with a disability (WHO, 2014).

In general, AT is used for aiding the DS students in their education, enhancing motivation and independency, and help them to be more active member in the social activities (Reed, 2007). AT might be adopted to support vision, hearing, reading or communication, as described by UNICEF (2013). Voice recognition applications, mobile devices, symbol-based interaction and virtual reality technologies are designed to assist the DS weakness to be more active in the learning process with their tutor and their classmate or peers (Winter and O'Raw, 2010; McKnight and Davies, 2013). Knowing the strength and weakness of the DS will enable the decision makers in setting plan to select the most appropriate AT to be adopted for more effective results. In addition, previous studies deduce that there is a need to identify intelligent ways to determine where, who, why and when to use AT (McKnight and Davies, 2013, Al-Ammary, 2010). However, the adoption of the Educational Technology in the classroom for the disabilities student's needs special and well skilled education teachers or specialists to refine their skills and trains them on how to interact and use the technology in the classroom. They need to work as coordinators and organizers to initiate Individualized Education Plans (IEP), which arrange a separate plan for each student by initiate schedule according to their cases to be able to consume extra time detecting the systems by themselves (Cramer et al., 2012).

Students with disabilities need specific and suitable education corresponding to their education level (Jenkinson, 1997). Teaching disabilities students in isolated classrooms enable the adoption of unifying curriculum for whole similar disabled students to support their self-assurance or confidence, as well as, make sure they will acquire appropriate privacy, safety and adequate enhancement (Jenkinson, 1997). However, such way of teaching could restrict and limit the DS capabilities acquired. Therefore, combining students with disabilities in general school currently become very popular in most countries, where this integration currently called inclusion or mainstream (Kliwer, 1998). Wang (2009), exposed that implementation of integration system may not comfortable for all students with disabilities, as consider that, students with disabilities may not be able to interact and participate with their normal peers. Thus, there is a need to integrate the usage of AT with different types of model for special education such as SETT, Education TechPoints, Human Activity Assistive Technology- HAAT, AT CoPlanner Model and others (Edyburn; 2001). Hersh and Johnson (2008) revealed that the goal of these models is to remove the existing barrier in using the AT which include tools, equipment, hardware, software, applications, etc, and make it easy for DS students to use AT anywhere and anytime. In addition, AT devices and services will allow DS students to have a better governor over their personal lives, be able to interact with normal people and participate more in social activities either in their homes, schools, work environments, or communities (McKnight and Davies, 2013)

ASSISTIVE TECHNOLOGY IN THE ARAB GULF COUNTRIES AND KINGDOM OF BAHRAIN

Although, the Arabian Gulf countries are aware about the disabled people and their various needs and provide vital efforts in enhancing their independency and performance, they are still beyond other countries in adopting AT is supporting the disabled people either in their education or social life (MADA, 2015). In Qatar for instant, there are a variety of associations for special needs such Qatar Society for Rehabilitation and Special Needs, Al Noor Institute for the Blind-Qatar, International Mosaic Down's Syndrome Association, and Qatar Assistive Technology Center. However, Qatar Assistive Technology Center was established just in 2010 by the Qatari Supreme Council of Information and Communication Technology, with an aim to use AT in the classroom, home and surrounding environments for engaging the disabled people in the revitalization environment and enhance their social interact and performance (MADA, 2015). In UAE there are more than 30 associations to qualify disabilities people such as Al Noor Training Centre for Children with Special Need, Zayed Higher Organization, Super Kids Nursery, Little Hands Kids Club, Sharjah American International School, Abou Hanifa Basic School, Al Baraa Kindergarten etc. (UAE Down Syndrome). However, only two associations include Al Noor Training Centre for Children with Special Need and Zayed Higher Organization – ZHO are using AT for teaching people with special needs. These associations are offering multi-disciplinary program and variety of consolidating services for nurturing the skills of the disable students by improving their performance and independence and encourage the social interaction with their peers. Among the AT that adopted by ZHO are labs which are equipped with computers that introduce with text-to-speech, screen reader, screen enlargement software as well as Braille printers, sensors, adaptive mouse and keyboards..

In Kuwait there are multiple special education schools for individual with special needs such as Al-Noor School, Al-Amal School, Al-Raja Schools, Al-Wafa Schools, Rehabilitation schools, School of autistic behavior, Schools of educational workshops, etc. However, only three of these schools are using AT in the teaching processes. These centers are highly depending on AT in the learning and teaching for supporting DS and other mental impairments. They are using different devices in teaching Kindergarten, primary, intermediary and secondary stages to assist students to become more independent, enhancing their abilities and improving student's self-care skills and social interaction. In Saudi Arabia there are various associations to support DS such Saut Society, The Help Center, Down Syndrome Charitable Association "DSCA", Al-Nahda Schools for Down Syndrome, etc. According to Ranaet al. (2011), there are 1237 institutes and programmers which have integrated the use of ICT in offering special education for people with learning disabilities. However, there is no clear information on the technologies being used by the various institutions for individuals with learning disabilities and the types of learning disabilities being dealt with (Rana et al., 2011).

Kingdom of Bahrain is providing more concern and focuses on disabled people by providing financial, psychological, and educational support. There are 1700 cases of DS and are recording 30 injured annually. Around 54 students with DS from different levels of study are registered in inclusions schools, while the others students are engaged in different rehabilitation and special needs centers supported by the Ministry of Labor and Social Developments - MLSD. There are 35 rehabilitation centers in Kingdom of Bahrain, include but not limited to Bahrain Hope Special Education Institute, Al Matrook Conductive Rehabilitation Centre and Bahrain, Hope Center for Early Care, Bahrain Down Syndrome society, Special educational services center for children "Tafaol" includes and Kayan Center for Special Education (Al-Watan, 2015). Al Matrook Conductive Rehabilitation Centre is providing AT for their students to support and expand the characteristic and physical abilities and skills. The AT provided include smart tablets, touch control panels, motor support tools, communication tablets, and others (MLSD, 2015). Recently there is an agreement between Bahrain Down Syndrome society and Special Educational Services Centre for Children (TAFA'OL), to initiate AT room in each center to use it for disabled students to promote, enhance and augment their capabilities, performance, independence and social interaction. However, criteria, policies and standards of the agreement are under study. Moreover, and as an appreciation for the importance of the DS and other disables individual in Kingdom of Bahrain, AlShaikh Nasser bin Hamad Al Khalifa – a Bahrain military office, member of Bahrain Royal Grand and president of the Bahrain Olympic Committee, announced "The Award of Nasser Bin Hamad for Disabled Persons Creativity" for promoting the capabilities and qualification of the disabled people and DS, improving their intellectual, artistic and scientific skills and expanding their innovation and creativity (MLSD, 2015). Furthermore, in 2007, the MLSD was established the disabled services centre. The centre was established particularly for employing the disabled people in the private and non-governmental sectors. It is responsible for processing the requests and applications of the disabled and their guardians and finding solutions for them in coordination with governmental and non-governmental organizations and private bodies.

RESEARCH MODEL AND HYPOTHESES

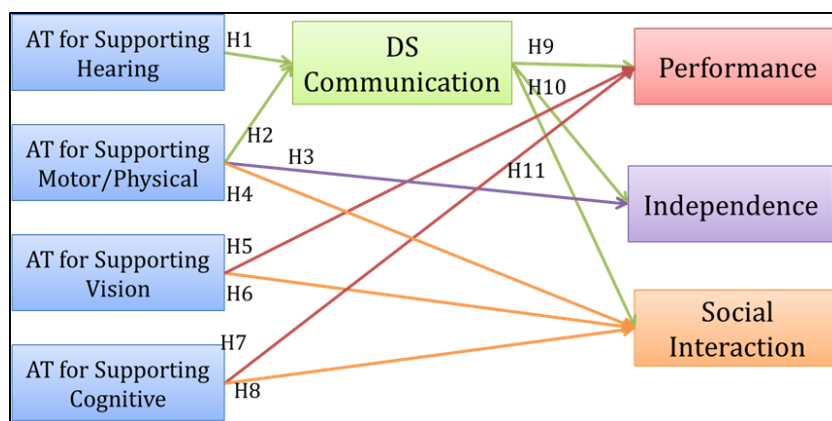


Figure 1. Research Model

The indirect impact of the AT for supporting hearing and motor/physical on performance via enhancing the DS communication:

Hearing impairments considered as main problems with DS as conductive and sensor-neural hearing loss are more common with DS than in the general population (Diefendorf, et al 1995). Such hearing loss can reinforces specific speech and language delay and difficulties in auditory processes which impact the DS communication (DSAWM, 2010). With the continuous advancement in technology, a wide range of AT devices were provided to support DS with different hearing problems, such as Personal Frequency Modulation (PFM) systems, Infrared systems, Induction loop systems, one-to-one communicators and others (Wiazowski, 2009). AT for supporting hearing impairments reduce the noise sounding and improve the speech recognition of DS which can help in improving their performance and enhancing the hearing effectiveness (Wiazowski, 2009). Such AT moreover, can enable the DS to communicate with, participate and contribute more effectively the the community, and be more independence which can maximize the DS overall quality of life (Cowan et al., 2012)). For example, voice output encourages DS with hearing impairments to start discussion and communication with other people easily from extended distances without any obstacles and complications (Doyle and Phillips, 2001). In general it can be revealed that AT for supporting hearing is the most important assistive tools to enable DS to define their strength and weakness and prompt communication, cooperating with surrounding environments and maximize their independence (Kumin, 2003; Lloyd et al., 2006, Olaosun and Ogundiran, 2013). This will decrease the needs of DS for outsider caregivers and minimize their deficiencies level. As such, DS can use such AT anywhere and anytime to communicate and interact with others through sound amplification or any other alternative ways so they can be able to participate and communicate without control with the community (Olaosun and Ogundiran, 2013, Lartz, et al. 2008, McCoy, 2013). Therefore, the following hypothesis was developed:

H1: AT for supporting Hearing has a positive impact on enhancing DS communication in the Kingdome of Bahrain.

As it was motioned above the communication skills of DS need to be enhanced and improved to be more independent. DS that lack the communication skills, scored significantly lower for expressive language, reading and writing (Buckley et al, 2006). For many DS, the inability to communicate with others can have a devastating effect on social personal skills (Deutschsmith, 2006). DS student's need more time, practice, consistency and reinforcement to be able to communicate and enhance their social interaction (Erdem, 2017) as effective communication skills and socially appropriate behavior are interrelated (Erdem, 2017). Improving DS communication skills provides a gateway to their independence, dignity and self-esteem, and allows them to move around their environment, communicate with others and take part in developing appropriate activities (Cowan and Khan, 2005).

Communication has a tremendous impact on the development of students with DS as it affects their ability to become contributing members in classroom and community. Enhancing communication of DS students will enhance their speech and language expression and provide plenty of opportunities for social activities (Jon et al, 1999). It has been revealed that AT that support people with hearing impairment can enable DS to communicate with others and exploring more different environments which has high potential in increasing and improving independence and confidence (Azenkot et al, 2011). Moreover, it may allow disabled people to be able to perform activities of daily living easily (Baker, 2003). Therefore, the following hypotheses were developed:

H9: Enhancing the communication of DS students has a positive impact on improving DS performance in the Kingdom of Bahrain.

H10: Enhancing the communication of DS students has a positive impact on enhancing DS independence in the Kingdom of Bahrain.

H11: Enhancing the communication of DS students has positive impact on enhancing the DS social interaction in the Kingdom of Bahrain.

Many DS have physical mobility, stability, motor coordination and range of motion challenges. Such disabilities need to be supported to enable DS movement and communication and ensure that this segment of people can be more independent and take part in their daily and routine activities (Mulligan, 2003). The delay in physical and motor skills could affect the physical education and sports activities. It may affect the DS's physical abilities in school, and has an impact on classroom activities, for example, drawing and coloring and handwriting development. Hence, the use of the AT that support motor/physical disabilities, such as special keyboard and mouse can help in developing the motor/physical skills of the DS so they can practice at home and school which can enhance their independence (Cook, 2011, Cowan et al., 2012). By adopting AT for support DS motor disabilities, DS will be able to manage the tasks independently, and build learning self-help skills (Cook, 2011; Kling, A., et. al., 2010). AT devices such light pointer, eye gaze direction, or head/mouth stick, can be used to leverage and encourage DS communication skills, and improve their performances and body functions to participate more effectively in their environment (Cook, 2011). Several other AT are available to assist DS in completing their social work including audio books for those who can't physically handle books. Moreover, keyboard adopters such as key guards can help DS to make selection more easily and prevent mistyping from tremors or less of control, while switches make it more possible for DS to access a computer keyboard using mouth, head or foot, and voice recognition software for students who can't type. This could reduce the need for informal caregivers where it takes the pressure off and can prevent burnout. Moreover, AT for supporting mobility such as wheelchair, scooters, walkers, canes and orthotic devices, prosthetic limbs, functional electrical stimulation, and wearable exoskeletons can expand DS performance and enhance their mobility and movement (Cowan, et al., 2012). Adopting AT to help DS with physical or motor disabilities may not be simple as it is very important to select the suitable AT devices that suit the DS level of disability, surrounding environment and other health problems (Mulligan, 2003). Previous studies have shown that AT for supporting motor/physical, when are appropriate to the user and the user's environment, have a significant impact on increasing the level of communication, independence and social interaction (Cowan and Khan, 2005). Therefore, the above mentioned discussion reveal strongly on the positive effect of the AT support for motor on enhancing the communication, independence and social interaction of the DS and simplifying their movement and overall life. Therefore, the following hypotheses were developed:

H2: AT for supporting motor/physical has positive impact on enhancing DS communication in the Kingdom of Bahrain.

H3: AT for supporting motor/physical has positive impact on enhancing DS independence in the Kingdom of Bahrain.

H4: AT for supporting motor/physical has positive impact on enhancing DS social interaction in the Kingdom of Bahrain.

The direct impact of AT for supporting vision on performance and social interaction of students with DS:

AT is designed to support people with diverse disabilities such vision or memory (Cognitive), by assisting them to do what they normally cannot do with an expected level. AT that support vision increase and sustain the capabilities of a student's performance, independence, and social interaction (Parette et al., 2007). Previous studies revealed that people with vision disabilities or blind are taking advantage from using AT it enhances their performance in learning and overall life (Bouck et al. 2011; Bowers et al. 2001; Ferrell 2006; Lovie-Kitchin et al. 2001; Spindler 2006). Developments in AT support vision result in a better achievement and high quality life for students with visual impairments, especially in educational processes as it enrich their performance and academic achievement (Koweru, 2015). For example, Talking Tactile Tablet devices which are supporting multi-sensory impairment can result in a positive impact on the performance of students suffering from visual impairment as these tools enable them to become more contributors and effective in the classroom (Cooper, 2015). According to the American Foundation for the Blind (2014), students with visual impairments faced obstacles in completing learning requirements, but AT can facilitate their ways to complete their assignments, coursework, task, etc. Hence it will support the performance of the students by enhancing their efficiency accomplish their tasks easily and within minimum time (Kareri et al., 2014). Furthermore, AT that support vision is supporting not only the students with visual impairments, but also enhance teacher skills for teaching students carefully, expand awareness, and enhance the performance of disabilities students to get superior consequences (Kareri et al., 2014).

On the other hand, the AT inspire disabilities, and enable people with vision impairment to express and interact easily with others without any obstacles by promoting their social skills, encouraging interaction with other peers and enriches the quality of the life of such people (Bird, 2000, Ee and Cohen, 2010). Additionally, Berry and Nees (2013) stat that AT such as Text-to-speech and auditory are contributing and assisting people with different disabilities, especially visual impairments. The advantages of such AT are removing the barriers and obstacles during interaction with others (Berry and Nees, 2013). Beside, people with visual disabilities are using AT for aligning their personal management skills to support the modification and adjustments in their capabilities to facilitate their interaction and reaction with others (Wiazowski, 2009). For example, Auditory Scanning devices facilitating understanding and interaction for people with vision impairment's. Currently, instructors used Neoteric AT and technical supports throughout teaching students with visual impairments, for providing professional and qualified support; to make them able to define their achievement and points of improvements in learning processes, where successfully provide modifications in their behaviors to promote interaction with other peers (Koweru, 2015). Therefore, the following hypotheses are developed:

H5: AT for supporting vision has a positive impact on enhancing DS performance in the Kingdome of Bahrain.

H6: AT for supporting vision has a positive impact on enhancing DS social interaction in the Kingdome of Bahrain.

The direct impact of AT for supporting cognitive on performance and social interaction of DS students

Evolving with technology, permits individuals with different impairments to ensure encouragements, ease of use, upgrade social image, commitments and satisfaction, and enhance social interaction with their normal peers (Carter et al., 2009; Edrisinha, et al., 2011; Lancioni et al., 2011). Social interaction will result in recognition, accepting and positive influences in managing disabled people lives and reducing reliance on caregivers (Felce and Perry, 1995; McDougall et al., 2010). According to Scherer et al. (2005), the main purpose of AT for supporting cognitive impairment is nurturing the DS performance on functional accomplishments, which assist them in minimizing needs to caregivers, and drive them to become more interactive in social life. AT can support people with cognitive impairment in expanding their quality of life and improve performance of sequential behavior (Neill et al., 2010). Wilson and Evans (1996) agreed that AT for supporting cognitive impairments such as virtual keyboards reorganizing letter digraph frequency augment remembrance, where it not only expands the performance of cognitive impairments, but also encourages them to be more corroborative through educational courses as it minimizing error occurrence.

On the other hand, the majority of the AT for supporting cognitive impairment has a significant role in enhancing the social interaction for people with cognitive impairment (Dawe, 2006). Teacher/specialists and family suggested that, the main role of AT has a positive impact on DS students with cognitive disabilities, as they enhancing and increasing their social interaction with other (Dawe, 2006). Students with cognitive disabilities are advised to use smart interface that recommends communication options and encourage interaction and conversation with partners and peers. For example, AT such as “persuasive” cellular phone that called the KIT phone (keep-in touch) can be used to reminds the people with cognitive to call other people in their contact list who they haven’t been in touch with recently which enhance the relationship development and social engagement (Golder, 2004). Therefore, the following hypotheses are proposed:

H7: AT for supporting cognitive has a positive impact on enhancing DS performance in the Kingdom of Bahrain.

H8: AT for supporting cognitive has a positive impact on enhancing DS social interaction in the Kingdom of Bahrain.

RESEARCH METHODOLOGY AND DATA COLLECTION

A self-administrated questionnaire was adopted in order to elucidate the impact of adopting AT to assist the DS in the class room and enhance their performance, engagement and interaction in the inclusion schools and rehabilitation centers in the Kingdom of Bahrain. The population of the current study was identified to be all those who are working with DS students such as teachers from inclusion schools, expertise and specialist from rehabilitation centers and family members. All the experts or specialists in all rehabilitation centers which shown in the Table (1) were selected. On the hand, all teachers assigned to teach in an inclusion class were selected from the inclusion schools shown in Table (1). Moreover, 400 randomly family were selected from a total of 1700 families that have DS. Therefore, the sample size was calculated to be 700 inclusion teachers, experts, and specialists and parents. Only 550 legible, correct and completed questionnaires were returned with a response rate of 71.4% which considered as high rate especially with the DSs’ families. The returned questionnaires consisted of 300 for teachers/specialist and 250 for families of DS students in the Kingdom of Bahrain. Due to the lack of well established scales developed to measure research model constructs such as AT for supporting vision impairment, AT for supporting hearing impairment, AT for supporting motor, AT for supporting cognitive and mental impairment, the measurement scales were developed by the authors. However, the measurement of communication was developed based on the measurement of Easlin and LaRose (2002) and Kaya and Weber (2003). Social interaction was developed based on the measurement of Mahadavinejad et al. (2014), while independence scales were adopted from Persel (2012).

Table 1: List of schools and rehabilitation centers in the Kingdom of Bahrain

Rehabilitation centers	Inclusion schools
Bahrain Hope Special Education Institute	IbnTufail primary school (Boys)
Bahrain Hope Center for Early Care	AlKhamis primary school (Boys)
Al-Wafa Autism Center	AlYarmook primary school (Boys)
Bahrain Down Syndrome Society	Al-Oruba primary school (Girls)
Special educational service center for children " Tafaol"	Arad primary school (Girls)
Kayan Center for Special Education	Al-Hidd secondary school (Girls)
NBB Rehabilitation Home For Disabled Children	Uthman bin Affan Intermediary school (Boys)
Salwa Club for disabled (Bin Khuldoon)	Alfarabi Intermediary School (Boys)
Salwa Club for disabled (Hamad Town)	UmaimabintAlNuman secondary school (Girls)
Academic and Vocational Rehabilitation Center	Isa town intermediary school (Boys)
	Alwadi primary school (Boy)
	Ghazi AlQusaibi secondary school (Girls)
	Imam al-Tabari Primary School (Boys)
	Al-Esteqlal secondary school (Girls)

DATA ANALYSIS AND RESULTS

Demography

The current section will present information on the demographics of the participants both teachers, experts, specialist and the families of the DS. Such information can provide explanation and indications on the results of the research model analysis. The results in Table (2) show that most of the participants are special and general educational teachers (34.8% and 18.6%, respectively). However, social worker and supervisor from the rehabilitation centers represent just (12.4 %). The inclusion teachers also represent few of the participants (8.1%). Moreover results in Table (2) show that most of the participants are young (40 or less, 73.9%) female (60.9%), and are holding bachelor (65.8%) and that is why they have few years of experiences (five or less, 66.1%). Table (3) presents demographic information on the families of DS students. The results show that most of the member of the families are young females (≤ 40 years old) (67.9% and 69.1% respectively). However, they are less educated as they are holding diploma or less (60.3%).

Table 2: Teachers demographic information

Gender		Education level	
Female	60.90%	Secondary	11.20%
Male	39.10%	Diploma	11.80%
Age		Bachelor	65.80%
20-30 years	36.60%	Master	9.30%
31-40 years	37.30%		
41-50 years	21.70%	Doctoral or more	1.90%
More than 50 years	4.30%		
Education Role			
Senior Head of education		6.20%	
Social supervisor		5.60%	
General education teacher		18.60%	
Special education teacher		34.80%	
The Social worker		6.80%	
Inclusion teacher		8.10%	

Table 3: Families demographic information

Gender		Education level	
Female	69.10%	Less than secondary	16.00%
Male	30.90%	Secondary	28.40%
Age		Diploma	25.90%
20-30 years	42.00%	Bachelor	23.50%
31-40 years	25.90%	Master	2.50%
41-50 years	28.40%	Doctoral or more	3.70%
More than 50 years	3.70%		
Related to the Down Syndrome			
Mother	57.10%		
Father	48%		
Brother/Sister	55.60%		
Other	31.6		

Current situation

regarding the adoption of AT for teaching DS students in Kingdom of Bahrain

The following section presents information on the current situation regarding the adoption of AT in teaching DS in the school or rehabilitation centers in term of the skilled teacher's gains, types of AT adopted, challenges and problem faced by family and teachers. The demographics information show that most of the participants include teachers, experts and supervisor were young that's why results in Table (4) have few years of experience in teaching the DS students (five or less years of experiences) (67.1%) and have adopt AT in teaching few courses (5 courses or less) (82.0%). However, the results show that they have no experience in using AT as they never evolve in any workshop (42.9%) or attended just 5 courses or less (39.8%).

Table 4: Experience of teacher/specialist in using AT in Kingdom of Bahrain

The families were asked to specified the best way for teaching their DS students were they revealed that the best way is to include their DS students in special school or centers (23.6%) not inclusion schools. However, they don't mind to adopt the AT either in special class or in inclusion class (32.9%, 31.1%, respectively).

Table 5: Family perception on the best ways for teaching DS students

Teaching DS in inclusion school	Teaching DS in special school	Adopting AT to teaching DS in inclusion class	Adopting AT to teaching DS in special class
12.40%	23.60%	31.10%	32.90%

Table 6: Types of disabilities that DS are suffering from

Types of disabilities that DS are suffering from	
Infantile paralysis	3%
Cognitive disability	58%
Communication impairment	37%
Motor/physical impairment	10%
learning difficulties	52%
Schizophrenia psychotic	10%
Vision impairment	19%
Development delay	36%
Traumatic brain injury	6%
Hearing impairment	12%
Speech/language	80%

Results on the different disabilities that DS students usually suffered from are presented in Table (6). Results show that DS mostly suffered from speech/language (80%), cognitive disabilities (58%) and learning difficulties (52%). Problems faced with DS students either in the home or in class room are demonstrated Figure (2). As shown in the table, teachers are mostly facing problems such as speech and communication (50.9%) and lack of focusing and understanding (58.4%). However, families are facing speech and language problems with reading and writing (76.5%) and (50.6%).

Experience in Teaching DS students		No. of courses in which AT was adopted		No. of Workshops or training on AT	
Less than one year	28.6%	None	38.5%	None	42.9%
1-5 years	38.5%	1 -5 courses	43.5%	1 -5 courses	39.8%
6-10 years	13.0%	6-10 courses	8.7%	6-10 courses	9.3%
More than 10 years	19.9%	More than 10	9.3%	More than 10	8.1%

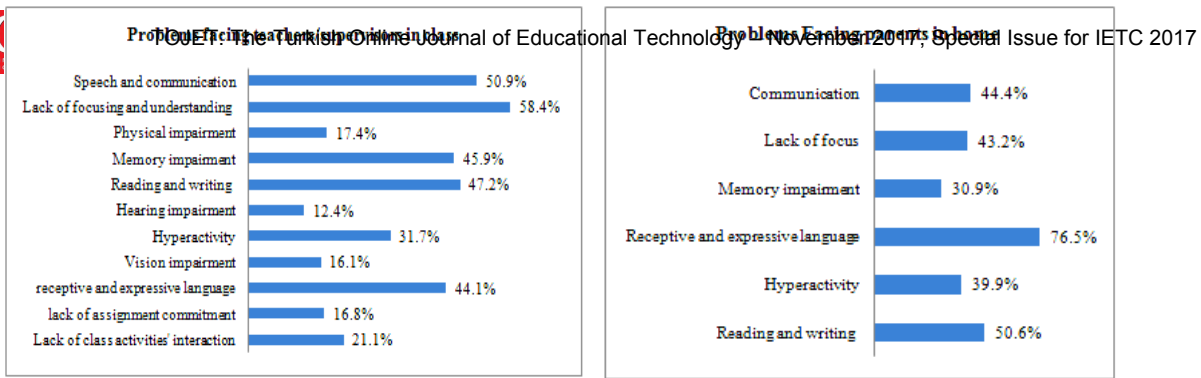


Figure 2: Problems faced by teachers and families with DS students

Although AT has many effects on supporting the learning and teaching of DS students, there are many challenges and barriers that may facing both teachers and family in adopting such technology. Therefore, teacher and families were asked to identify the most barriers they perceived in adopting AT and results are presented in Table (7). The results illustrate that both teachers and families are facing two main barriers: selecting and choosing the suitable AT (41.6% and 59.3% respectively) and the high cost of the AT (46.9%, 43.2%, respectively), as well as the lack of training provided on AT (31.7%) and lack of sufficient skills and experience to adopt AT(32.9%).

Table 7: Barriers for adopting AT for supporting DS students

Barriers are facing while adopting DS students BY:	Teacher, experts and specialists	Family
Difficult to encourage DS to adopt AT	27.7%	4.9%
Adopt the suitable AT	41.6%	59.3%
Complexity of AT (not easy to use)	15.5%	4.9%
Lack of sufficient skills and experience to adopt AT	32.9%	25.9%
Adopt poor and cheap AT	13.0%	7.4%
lack of training provided on AT	31.7%	27.2%
High cost of AT	46.0%	43.2%
Availability of AT	21.1%	6.2%
Perceived benefit of AT	30.3%	24.6%

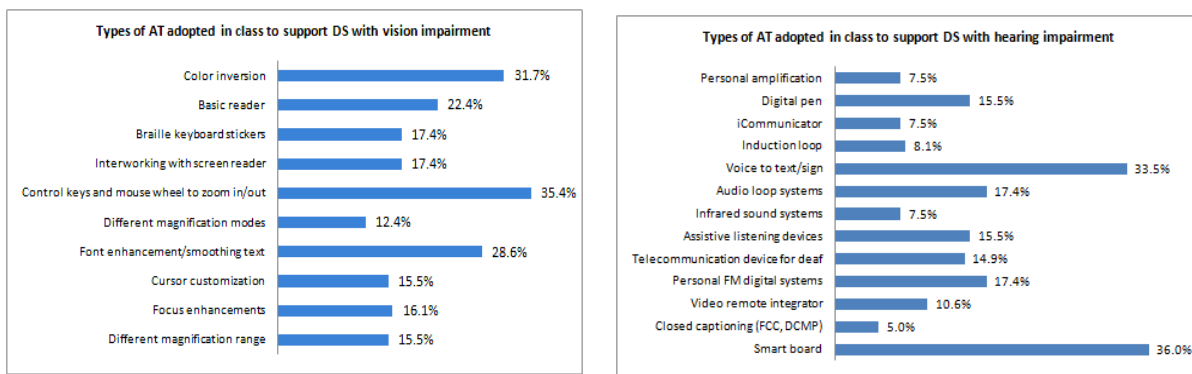


Figure 3: AT adopted for supporting DS with vision and hearing impairments

Finally, the different types that have been adopted in class to support the different impairments include the vision, hearing, motor and cognitive were identified as shown in Figure (3) and Figure (4). Regarding to the types of AT adopted to support the vision and hearing , the results revealed that control keys and mouse wheel to zoom in/out (35.5%) and smart board (36.0%) were identified to by the main adopted AT to support vision and hearing impairment, respectively. On the other hand the results in Figure (4) show that electronic notebook (50.3%) and graphic organizers (34.2%) are the main AT adopted for supporting the cognitive impairment. However, touch screens (56.5%) and trackball for easer mouse manipulation (28.0%) are very important AT that has been adopted to support the motor impairment.

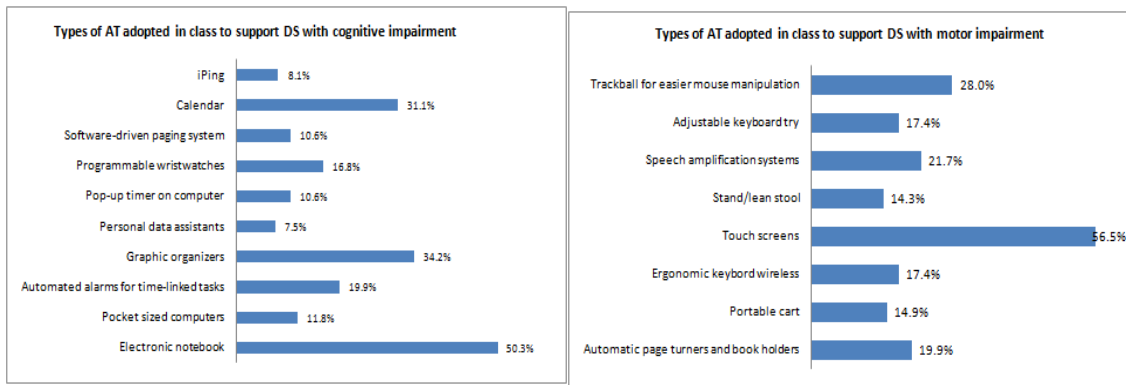


Figure 4: AT adopted for supporting DS with cognitive and motor impairments in class room

Assessing model measurements

PLS path analysis was done using SmartPLS-3 to test the research model. Goodness-of fit indexes of latent variables are shown in Table (8) and Table (9), which indicates that the model has good fitness. All the value of AVE are mostly greater or equal to 0.5 and all values of composite reliability are greater than 0.8, while all value of Cronbach's Alpha are greater than 0.7.

Table 8: AVE, composite reliability and Cronbach's Alpha

Construct	AVE	Composite Reliability	Cronbach's Alpha
AT for Supporting Cognitive	0.658	0.92	0.896
AT for Supporting Hearing	0.69	0.899	0.85
AT for Supporting Motor/Physical	0.685	0.897	0.846
AT for Supporting Vision	0.654	0.883	0.823
DS Communication	0.658	0.906	0.87
Independence	0.79	0.919	0.867
Performance	0.698	0.92	0.891
Social Interaction	0.724	0.929	0.905

Table 9: Factor loading of the items.

Construct	Items	Factor Loading	Construct	Items	Factor Loading
AT for Supporting Cognitive	CS.1	0.806	AT for Supporting Vision	VS.1	0.821
	CS.2	0.804		VS.2	0.852
	CS.3	0.788		VS.3	0.761
	CS.4	0.849		VS.4	0.797
	CS.5	0.819			
	CS.6	0.8			
AT for Supporting Hearing	HS.1	0.843	DS Communication	CMS.1	0.782
	HS.2	0.849		CMS.2	0.821
	HS.3	0.861		CMS.3	0.83
	HS.4	0.767		CMS.4	0.819
				CMS.5	0.801
AT for Supporting Motor/Physical	MS.1	0.809			
	MS.2	0.858			
	MS.3	0.84			
	MS.4	0.803			

Research hypotheses testing

The causal relationships in the proposal research model were tested. Consistent with Chin (1998), bootstrapping was applied to produce standard error and t-statistics. This permits the measurement of the statistical significance of the path coefficients. The statistical objective of PLS is to show high path coefficient - R and significant t-statistics, thus rejecting the null hypothesis of no effect. The t-statistics need to be significant to support the hypothesized paths. R indicates the explanatory power of the latent endogenous variables.

Properties of the causal paths, including standardized path coefficients, t-statistics and explanation of variance for each equation in the hypothesized model are presented in Table (10) and Table (11). As expected, the results reveal that adopting AT to support some impairments of the DS have some impact on enhancing their communication, independency, performance and their social interaction. AT has vital role in enhancing the communication of the DS students as it can be enhance directly or act as intermediate in enhancing the engagement of DS in the learning process as the normal students. As such, the results indicate that by enabling the communication of the DS students, they can be more independent, reach better achievement and performance, and interact more in the social life. Thus, H9, H10, and H11 were accepted (($r=0.694$, $T= 9.038$), ($r=0.575$, $T= 8.301$), ($r=0.566$, $T= 5.748$), respectively). Moreover, H1 and H2 were accepted (($r=0.343$, $T= 4.469$) and ($r=0.571$, $T= 8.89$), respectively), thus enabling the communication of the DS can act as an intermediate factor for the impact of the AT for supporting hearing and motor on the performance. While, AT for supporting motor of the DS has a direct impact on the independence ($r=0.287$, $T= 4.21$) it has only indirect impact on enhancing the social interaction of the DS but not direct impact ($r=0.116$, $T= 1.66$). Thus, H3 was accepted and H4 was not accepted.

On the other hand, the AT for supporting the DS with vision impairment has shown insignificant effect on enhancing the performance and the social interaction of this segment of students. Hence, H5 and H6 are rejected ($r=0.102$, $T= 1.548$ and $r=0.074$, $T= 1.188$). Finally while, AT support for the cognitive of the DS shown a weak impact on the social interaction of DS students ($r=0.184$, $T= 2.149$), they has shown insignificant impact on enhancing the performance of the DS students ($r=0.121$, $T= 1.873$) as shown in Table (10).

Table 10. Path analysis

Path	Coefficients (β)	T-Test	P-Values	Hypothesis statues
H1: AT for Supporting Hearing -> Communication	0.343	4.469	0	Accepted
H2: AT for Supporting Motor/Physical -> Communication	0.571	8.888	0	Accepted
H3: AT for Supporting Motor/Physical -> Independence	0.287	4.21	0	Accepted
H4: AT for Supporting Motor/Physical -> Social Interaction	0.116	1.66	0.098	Rejected
H5: AT for Supporting Vision -> Performance	0.102	1.548	0.063	Rejected
H6: AT for Supporting Vision -> Social Interaction	0.074	1.188	0.235	Rejected
H7: AT for Supporting Cognitive -> Performance	0.121	1.873	0.062	Rejected
H8: AT for Supporting Cognitive -> Social Interaction	0.184	2.149	0.032	Accepted
H9: Communication -> Performance	0.694	9.038	0	Accepted
H10: Communication -> Independence	0.575	8.301	0	Accepted
H11: Communication -> Social Interaction	0.566	5.748	0	Accepted

On the other hand, the results has shown that AT for supporting the motor and hearing impairments of the DS explained 63% of the variance in enabling the communication skills of DS; which in turn, explained 74% of the variance of the performance while AT for support for both cognitive and vision have no impact on that variances. Conversely, AT for supporting motor and enabling DS communication are explaining 66% of the variances on enhancing the independency of the DS, while AT for supporting the cognitive of the DS and the enabling of their communication are explaining 75% of enhancing the social interaction of the DS as shown in Table (11).

Table 11: R Square of the items

	R Square
DS Communication	0.628
Independence	0.661
Performance	0.740
Social Interaction	0.746

DISCUSSION AND CONCLUSIONS

With the increasing number of DS in Kingdom of Bahrain, there is a need to exploit the opportunities provided by the rapid succession in the innovative ICT and AT to make life easier for these segments of people and enables them to communicate and participate in the community and provided them with the best way of learning. Although Kingdom of Bahrain are providing vital efforts for enhancing the development of people with special needs and DS and involve them more as contributable persons in the community, they still not reaching a mature level in adopting AT in the teaching and learning processes of DS in the inclusion schools or rehabilitation/special centers. It have revealed that lack of ICT accessibility, lack of resources and lack of skills are the major challenges that hinder the use of technology in the learning institutions. This implies that even if there are schools make available for supporting the educational needs of children with DS, they may not be adequately equipped with modern technologies for supporting their learning. In the Kingdom of Bahrain the inclusion of DS and other students with minor disabilities and special needs in the standard learning and teaching process started just on 2001 as an ad hoc process but reached more structured and more manageable process on 2011. The results of the current study reflect the current situation of the adoption of AT in inclusion schools or rehabilitation/special centers. The findings demonstrated that there are a reasonable numbers of specialists and teachers for teaching DS either in the inclusion schools or in the rehabilitation centers with specialists, supervisors or special education teachers in rehabilitation centers represents (34.8%) while specialist teachers in the inclusion schools represents just (8.1%). Thus, there is still a shortage in the specialist teachers in the inclusion schools that can help in teaching DS students. Moreover, the majority of the teacher/specialists who are taking care about DS students are females. Actually, female with their natural skills and characteristics as they are full of tenderness and passion can be more suitable for dealing with DS students and thus, can contribute, collaborate and embraced the DS students either in the classroom or home.

Regarding the capabilities of the teachers and specialists, the findings reveal that there is a need for building and enhancing the capacity in this field. The finding revealed that most of the teachers/specialists are young with high level of education as they hold at least bachelor or higher degree but with few years of experience; no more than 5 years. However, it is not essential for those who want to teach DS students to be graduated with psychology or special education. They can be graduated with any specialization such as science, art or any other field of study. Graduated with special education, psychology will obtain importance skills and knowledge needed for such occupation to be able to understand DS capabilities and needs. Moreover, the majority of teachers/specialist have applied the AT in maximum five courses without attending workshops interrelated to the adoption of AT. Thus they have a little knowledge about AT and are not prepared well for adopting AT in classrooms as most of the teachers/specialists confirmed that they are "somehow prepared". Few workshops were provided for the teacher/specials to prepare them to deal with this segment of students and how it can be adopted in teaching DS students. Increasing knowledge and experience of the professionals in using AT will lead to an increase in education opportunities for DS (Erdem, 2017). Government should pay more attention in building the capacity and skills of specialists and teachers in using new technology.

Parent of DS students think that the best ways to improve the learning quality of their DS students is through adapting AT in inclusion schools but not in rehabilitation or special centers. DS can be improved and do well if they involve in school with normal students. Keep DS students in special environment with special students will restrict their ability for improvement. In a press conference conducted on 2010, decision makers from Ministry of Education-MOE in Kingdom of Bahrain have discussed the possibilities of the inclusion of the DS in kindergartener level in the normal kindergartens and the need for enhancing the learning of these people (Alwasat, 2010). Moreover, parents of the DS have confirmed in many events conducted by the Bahrain Down Syndrome Society in Kingdom of Bahrain that they want their DS to be taught and qualified in inclusion school not in special center or an isolation environment (Alwast, 2003). They demonstrate that teaching DS in inclusion school will offer the opportunity for the DS individual to share and participate in the general life and community (Alwast, 2003). When the inclusion class implemented effectively it will offer academic and social benefits for DS students. Many parents of children with DS revealed that the inclusion experience have many benefits, including higher self-esteem, improved speech and communication, friendship development, independence in daily life activities, high educational accomplishment, and social interactions (DSAWM, 2010).

Teaching DS is not easy as it necessitate the understanding of these people and identify their weakness, strength and problems to be able to deal with them in a proper way and adopt the most suitable AT that may support their impairments. In addition, there are many problems are facing DS students either because of their nature and special characteristics or in adopting the AT in their teaching and learning processes. There are many problems that may be faced by DS in classroom or family at home. However, these problems may not be the same as DS may be impacted by the environment surrounding them. As such, the finding of the study show that the main problems faced by teachers/specialists in classroom are the "lack of focusing and understanding", "difficulties in speech and language", and "communication with others", while at home, family are facing problems such "receptive and expressive language", "reading and writing" and "lack of focus". Concerning the problems that are facing teachers/specialists and family in adopting AT in teaching DS, the findings disclosed that the main challenges and barriers that are faced by teacher/specialists in adopting AT are "high cost of AT devices" and "adopt the suitable AT" in the suitable situation. Both teacher/specialists reveal that they are striving to acquire AT to improve and expand the capabilities of DS students but due to the high cost of the AT sometime it become impossible. Hence, the both government and private sectors need to support the family, schools and rehabilitation centers with an adequate financial support. Actually, digital empowerment in Kingdom of Bahrain is the main concern of the MOE as a high budget was set to enhance the digitization. As the AT is a way for DS students' empowerment and will enhance the student digital empowerment it needs to be the focus of the MOE in the Kingdom of Bahrain. Moreover, they need to help in determining the specific types of AT needed by each DS students according to their case either in the inclusion school or rehabilitation center by enhancing the research and academic studies in this field. There is a need to develop an appropriate assessment tools to help decision makers in evaluating and selecting the most suitable AT for improving the academic and social life of the DS students (Erdem, 2017).

By identifying the problems and the characteristics and needs of the DS students, it will be easy to identify the most appropriate AT in improving their learning. However, with the problems faced in adoption AT in Kingdom of Bahrain, mostly inappropriate AT was adopted. The findings show that a low level technologies, cheap and very simple that does not need experience or skills AT was adopted. As such "control keys and mouse wheel to zoom in/out" are adopted to support DS with vision impairment because of its ease/effortless and low cost. However, "different magnification modes" is not adopted because of its complexity and the teacher/specialists do not have the enough experience to adopt such tools. For supporting DS with hearing impairments, "smart-board and voice to text/sign" are the most adopted AT in inclusion schools and rehabilitation as they are flexible and easy to use for both teachers/specialists and students. Whereas, "closed captioning (FCC, DCMP) which may have better effect was not adopted because it need special skills and experiences. On the other hand, "electronic notebook" adopted for supporting DS students with cognitive impairments, while PDA and iPing are not adopted. Finally, findings elucidate that "touch screen" which is commonly used for DS students with motor impairments was adopted because it is easy to use and not required a lot of training.

Although several studies have confirmed that AT has a positive effect on supporting DS, there are few studies that attempted to examine that effect empirically. Therefore, the impact of AT on the DS students was examined and assessed by developing a theoretical model based on the available literature in the related field. The model has a main hypothesis indicate that adopting AT in teaching DS students can enhance their performance, social interaction and independence. AT can support different disabilities and characteristics of the DS and hence, the research model has identified the effect of each type of AT on the aforementioned effects. In general it can be concluded that the adoption AT in teaching and learning of DS students can enable them to be more social and independent person. AT for supporting hearing and motor have an effective impact in enhancing the communication of DS students which in turns effect their independence, social interaction and social interaction directly. While AT for supporting motor has indirect effect on independence, social interaction and social interaction via enhancing the communication of the DS students, they have direct effect on enhancing their independence but not their social interaction. AT for supporting cognitive of DS has shown to have a strong impact on enhancing the social interaction of DS but not their performance. However, the finding indicated that AT for supporting vision has no impact on enhancing the performance or the social interaction. These results are against what have been revealed and approved by previous literatures. Therefore, more investigation needs to be conducted to examine the indirect effect of the AT for supporting vision impairments of DS or adopting larger sample of size to get more reflective results. Overall, the importance of enhancing the communication of the DS was the main findings of the model analysis. In many respects, the improvement of the communication of DS can motivate DS people especially those with speech and language disabilities, to involve in competition with others by attending workshops encourage participation with others (McCoy, 2013). In addition, it provides a gateway to the independence, dignity and self-esteem, and allows children to move around their environment, communicate with others and take part in appropriate activities that they would be unable to do without technology (Cowan and Khan, 2005).

The main aim of the current research was to investigate the current situation regarding the adoption of AT in teaching and learning DS students in inclusion schools and rehabilitation centers. In addition, the impacts of AT in enhancing the independence, performance and social interaction of DS students were examined. The study demonstrate that AT are playing a vital role in supporting the learning of DS and enabling them to be an active member by enhancing their communication, performance, social interaction and independence. Kingdom of Bahrain provides more effort and focus on the DS and established a long term strategic plan for having such segment of people as a normal person that can live like others and act normally in the general life.. They provide different inclusion programs for the disables and special needs. They started by providing these programs in eight primary schools in 2001-2002 and recently they have such program in 54 schools in different level. They also provide a special curriculum for the DS and special assessments. The MOE started with an academic inclusion (mainstreaming) and shifted to the social inclusion (normalization) (Alwasat, 2003). Moreover, there are many AT were provided for supporting motor, vision and hearing imperilments of DS such as buss with elevator to simplify the movement of the DS and support the motor and assign their classes in the ground floor with special and well equipped bathroom. Moreover, they provide Dell touch computer, pronto, CCTVE, CCTV, Digital amplifiers and others. On the other hand, some professional certificate such as the agriculture program are providing for DS to enhance some of their skills and improve their social interaction. They are also assigning specific scholarships for DS that have finished the secondary school (Alayam, 2015).

However, to exploit the opportunities provided by AT, consideration should be paid to many aspects such as the capacity building of the teachers/specialist, types of AT to be adopted, the environment where to adopt the AT and the DS themselves. Government's strategic plan should consider building capacity on AT and emergent technology to have sufficient specialists to satisfy the needs of the disabled segments in the country. More attention should be paid for building capacity and skills for using AT by teachers/specialist at inclusion school and rehabilitation centers via involving them in more workshop and courses. They can be involved in direct and indirect training as a way for building capacity and skills. A direct training can be conducted through the involvement of specialists, developers, special educators, teachers and volunteers in different workshops and courses. While indirect training can be achieved through the communications with house holders and disabled parents. Moreover, indirect way of enhancing knowledge and experiences of AT for supporting DS can be done through implementation of special e-learning networks for teachers in inclusion schools to exchange lessons courses and information among themselves or network let say "Bahrain DS", include all societies that are concern about the DS in Bahrain, experts. Such online networks will support DS students and their parents and family so that they can inquire about certain services, suitable support and guidance for DS. Moreover, school that are successful in integrating students with DS must have an effective leadership to deal with student's individual needs and commitment to provide a broad and balanced range of curriculums for all students (Krahn et al., 2015). Therefore, MOE should pay more attention in building well established academic leadership. On the other hand, decision makers need also to enhance the financial support for the special needs centers and inclusion schools that can help them in establishing a well qualified environment for providing more effective services for this segment of people. Social community and business sectors should support inclusion schools and rehabilitation centers financially to be able to provide and improve the current AT. As such Tamkeen and Economic Development Bank - EDB can offer free workshop through a memorandum of understanding with MOE, while banking sectors and other financial institution in the country can help in supporting schools and rehabilitation centers with the appropriate AT.

REFERENCES

- Ahmed, F.K. (2015), Use of Assistive Technology in inclusion education: making room for diverse learning needs, *Transcience*, Vol. 6, No. 2, pp. 62-77
- Al-Ammary, J. (2010), "Educational Technology: A Way To Enhance Student Achievement At The University Of Bahrain", *Procedia-Social and Behavioral Sciences*, Vol (55), pp. 248-257
- Alayam (2015), No. 9624, Available online: www.Alayamnews.com
- Al-Edwan, S. (2013), "Developing the mathematical skills among sample of Down Syndrome by education", *Journal of Education and Practice*, Vol. 4, No. 16, pp. 145-156
- Alwasat (2003), No. 424, Available online: www.alwastnews.com
- Alwasat (2010), No. 2791, available online: www.alwastnews.com
- Azenkot, S., Prasain, S., Borning, A., Fortuna, E., Ladner, R., Wobbrock, J. (2011), "Enhancing independence and safety for blind and deaf blind public transit riders", in *proceeding of SIGCHI conference on Human Factors in Computing Systems*, Vancouver, BC, Canada, May 07-12, pp. 3247-3256
- Baker, B.L., McIntyre, L.L., Blacher, J., Crnic, K., Edelbrock, C., Low, C. (2003), "Pre-school children with and without developmental delay: Behavior problems and parenting stress over time", *Journal of Intellectual Disability Research*. Vol. 47, pp. 217-230.
- Berry, L., Phillips, C., and Nees, M.A. (2013), "Readers as an audio accommodation in high stakes standardized testing: Difficulties with experimental approaches", Presented at the *28th Annual LVAIC Undergraduate Psychology Conference*. Vol. 20
- Bird G, Alton S, Mackinnon C. (2000), "Accessing the curriculum - Strategies for differentiation for pupils with Down Syndrome", *Down Syndrome Issues and Information*
- Bouck, E. C., Flanagan, S., Joshi, G. S., Sheick, W., and Schleppenbach, D. (2011), "Speaking math-A voice input, speech output calculator for students with visual impairments", *Journal of Special Education Technology*, Vol.26, No. 4, PP.1-14.
- Bowers, A. R., Meek, C., and Stewart, N. (2001), "Illumination and reading performance in age related macular degeneration", *Clinical and Experimental Optometry*, Vol.84, No. 3, PP.139-147

- Bucket, S., Brid, G., Sacks, B. and Archer, T. (2006), "A comparison of mainstream and special education for teenagers with Down Syndrome: Implication for parent and teacher", *Down Syndrome Research and Practices*, Vol. 9, pp. 54-67
- Carter, E. W., Owens, L., Trainor, A. A., Sun, Y., and Swedeen, B. (2009), "Self-determination skills and opportunities of adolescents with severe intellectual and developmental disabilities", *American Journal on Intellectual and Developmental Disabilities*, Vol.114, PP.179–192.
- Cook, A. M. (2011). "It's Not About The Technology, or is it? Realizing AAC Through Hard and Soft Technologies". *Perspectives on Augmentative and Alternative Communication*, Vol.20,No. 2, PP.1-64.
- Cooper, H. (2015), "Identifying infants and young children with visual impairments", *Texas Child Care Quarterly*, Vol. 38, No.4
- Cowan,D and Khan,Y (2005), "Assistive technology for children with complex disabilities", *Current Paediatrics*, vol. 15, pp 207–212.
- Cowan,R. Fregly, B. Boninger,M., Chan,L., Rodgers,M. And Reinkensmeyer, D. (2012), "Recent Trends in Assistive Technology for Mobility", *Journal of Neuroengineering and Rehabilitation*, Vol. 9, No. 20, P.1-8
- Cramer N, Galdzicki, Z. (2012), From abnormal hippocampal synaptic plasticity in Down Syndrome mouse models to cognitive disability in Down Syndrome. *Neural Plast* 2012:101542
- Dawe, M. (2006), "Desperately Seeking Simplicity: How Young Adults with Cognitive Disabilities and Their Families Adopt Assistive Technologies", in *proceeding of CHI conference*, Montreal, Queen, Canada, PP.1-10.
- DeutschSmith, Deborah. Introduction to Special Education: Teaching in an Age of Opportunity. 5th ed. (Boston: Pearson Education Inc., 2006), 149183
- Diefendorf A., Bull, M, Casey-Harvey, D., Miyamoto, R. , Pope, M., Renshaw, J., Richard L. Schreiner, R., and Wagner-Escobar, M (1995), "Down Syndrome: A Multidisciplinary Perspective", *Journal of the American Academy of Audiology*, Vol. 6, No. 1, PP.39-46
- Doyle, M. and Phillips, B. (2001). "Trends in Augmentative and Alternative Communication Use by Individuals With Amyotrophic Lateral Sclerosis". *Augmentative and Alternative Communication*, Vol. 17, No. 3, PP.167–178
- DSAWM (2010), Supporting the Student with Down Syndrome in Your Classroom, Educator Manual, Down Syndrome Association of west Michigan: Possibility, Promise and Potential
- Eastin M. S. and LaRose, R. (2000), "Internet self-efficacy and the psychology of the digital divide", *Journal of Computer-Mediated Communication*, Vol. 6, No. 1
- Edrisinha, C., O'Reilly, M. F., Choi, H. Y., Sigafos, J., and Lancioni, G. E. (2011). "Say cheese: Teaching photography skills to adults with developmental disabilities". *Research in Developmental Disabilities*, Vol. 32, No. 6, PP.36–642.
- Edyburn, D. L. (2001). Models, theories, and frameworks: Contributions to understanding special education technology, *Special Education Technology Practices*, Vol.4, No. 2, pp. 16-24
- Erdem, R. (2017), "Student with speachel needs and AT, a literature review", *The Turkish Online Journal of Education Technology-TOJET*, Vol. 16, No. 1, pp. 128-146
- Faragher, R., and Brown, R. I. (2005), "Numeracy for adults with Down Syndrome: It's a matter of quality of life", *Journal of Intellectual Disability Research*, Vol. 49, No. 10, pp. 761–765.
- Felce, D., and Perry, J. (1995), "Quality of life: Its definition and measurement", *Research in Developmental Disabilities*, Vol. 16, pp. 51–74.
- Feng, J. and Lazar, J. and Kumin, L. and Ozok, A. (2008), "computer usage by young individuals with Down Syndrome: an exploratory study" , in *proceedings of the 10th International ACM Sigaccess Conference on Computers and Accessibility*, PP. 35-42 Halifax, Nova Scotia, Canada
- Ferrell, K. (2006), "Evidence-based practices for students with visual disabilities", *Communication Disorders Quarterly*, Vol. 28, pp. 42–48.
- Gierrach, J., and Stindt, K. (2009), "Assistive technology for activities of daily living", *Assessing Students' Needs for Assistive Technology (ASNAT) 5th Edition – complete version*. J. Gierach (Ed.). (p.1-16) .
- Golder, S.A. (2004), "The keep-in-touch phone: A persuasive telephone for maintaining relationships. In proceeding of the CHI EA '04' Extended abstracts on human factors in computing systems, Vienna, Austria, April 24-29, pp. 1551-1551

- Hersh, M. A., and Johnson, M. A. (2008), "On modelling assistive technology systems part 1: modeling framework", *Technology and disability*, Vol. 20, pp. 193-215
- Jenkinson, J.C. (1997), *Mainstream or Special? Educating Students with Disabilities*. London: Routledge.
- Jon, M. and Paul, H. (1999), *Improving the communication of people with Down Syndrome*, Brooker, Pub.
- Kareri, F. W. M. (n.d.). Perkins.org. (W. M. Francis Kareri, Editor, W. M. Francis Kareri, Producer, & Kenya Union for the Blind) Retrieved September 2014, from Perkins.org: www.perkins.org/.../kareri..w..Mutua...J...
- Kaya, N. and Weber, M. J. (2003), "Privacy regulation and college adjustment: A comparison of American and Turkish freshmen living in residence halls", *College Student Journal*, Vol. 37, No. 1, pp. 79-92.
- Kliewer, C. (1998). "The meaning of inclusion", *Mental Retardation*, Vol. 36, pp. 317-322
- Kling, A., Campbell, P., and Wilcox, J. (2010), "Young Children With Physical Disabilities", *Infants & Young Children*, Vol. 23, No. 3, pp.169-183.
- Koweru, R., Omoke, C. and Orodho, J. (2015)., "The Role of Assistive Technologies on Quality Educational Outcomes of Student with Visual Impairment in Kisumu County, Kenya.
- Koweru, R.A., Omoke, C.M, and Orodho, A.J. (2015), "The role of assistive technology on quality educational outcomes of students with visual impairments in Kisumu County, Kenya", *Journal of Humanities and Social Sciences of the Organization of Social Science Research (IOSR-JHSS)*, Vol. 20, No. 3.
- Krahn, G. and Fox, M., (2015), "Public health perspective on intellectual and developmental disabilities", in Ed Rubin, L., Merrick, J., Donald, G. and Patel, D., *Health care for people with intellectual and developmental disabilities across the lifespan*, Springer
- Kumin, L. (2003). *Early Communication Skills in Children with Down Syndrome: A Guide for Parents and Professionals*. Third edition, Bethesda, MD: Woodbine House.
- Lahm, E. (2002), "Factors that influence assistive technology decision making", *Journal of Special Education Technology*, Vol. 17, No. 1, pp. 15-26
- Lancioni, G. E. , Sigafoos, J., O'Reilly, M. F., and Singh. N. B. (2013), "Defining assistive technology and the target populations", in ed. *Assistive technology. Interventions for Individuals with Severe/Profound and Multiple, Autism and psychopathology Series*, Springer
- Lancioni, G. E., Singh, N. N., O'Reilly, M. F., Sigafoos, J., Green, V., Oliva, D., et al. (2011), "Microswitch and keyboard-emulator technology to facilitate the writing performance of persons with extensive motor disabilities", *Research in Developmental Disabilities*, Vol. 32, pp. 576–582.
- Lartz, M., Stoner, J. and Stout, J.L. (2008), "Perspectives of Assistive Technology from Deaf Students at a Hearing University", *Assistive Technology Outcomes & Benefits (ATOB)*, Fall2008, Vol. 5, No.1, pp. 72-91.
- Lloyd, J., Moni, K., and Jobling, A. (2006), "Breaking the hype cycle: using the computer effectively with learners with intellectual disabilities", *Down Syndrome Research and Practice*, Vol.9, No. 3, pp. 68-74.
- Lovie-Kitchin, J. E., Bevanm, J. D., and Hein, B. (2001), "Reading performance in children with low vision", *Clinical and Experimental Optometry*, Vol. 84, No. 3, pp. 148–154
- MADA (2015), Marhaba.qa, Mada and Al Noor Institute Sign Agreement to Support Technological Needs of the Blind in Qatar. [online] Available at: <http://marhaba.qa/mada-and-al-noor-institute-sign-agreement-to-support-technological-needs-of-the-blind-in-qatar/> [Accessed 24 March 2015].
- McCoy, K., Arnott, J., Ferres, L., Oken, M., and Roark, B. (2013), "Speech and Language processing as assistive technologies", *Computer Speech and Language*, Vol. 27, pp. 1143–1146.
- McDougall, J., Evans, J., and Baldwin, P. (2010), "The importance of self-determination to perceived quality of life for youth and young adults with chronic conditions and disabilities", *Remedial and Special Education*, Vol. 31, pp. 252–260
- McKnight, L., and Davies, C. (2013). *Current Perspectives on Assistive Learning Technologies: 2012 review of research and challenges within the field*. Oxford.
- MLSM (2015), Ministry of Labor and Social Development , Kingdom of Bahrain, available online: www.social.gov.bh, access on Dec 22, 2015
- Mulligan, S. (2003), "Assistive Technology: Supporting the Participation of Children with Disabilities", *Young Children*, Vol. 58, No. 6, pp. 50-51.
- Neill, B., Moran, K. and Gillespie, A (2010), "Scaffolding rehabilitation behavior using a voice-mediated assistive technology for cognition, Neuropsychological rehabilitation, Vol. 20, No. 4, pp 509–527.
- Olaosun, A and Ogundiran, O. (2010), "Assistive Technology For Hearing and Speech Disorders", *Journal of Biology, Agriculture and Healthcare*, Vol.3, No.17.

- Parette, H., and Peterson-Karlan, G. (2007), "Facilitating student achievement with assistive technology", *Education and Training in Developmental Disabilities*, Vol. 42, No (4), pp. 387-397
- Percy, M. and Schormans, A. (2006). "Down Syndrome", *Journal on Developmental Disabilities*, Vol. 12. No. 1, pp. 1-6.
- Persel, C. (2012). The Independent Living Scale. *The Center for Outcome Measurement in Brain injury*. <http://www.tbims.org/combi/ils> - accessed June 29, 2017 .
- Reed, P. (2007). A resource guide for teachers and administrators about assistive technology Wisconsin Assistive Technology Initiative. (pP.1-22). Oshkosh, Retrieved from [http://www.wati.org/content/supports/free/pdf/ AT Resource Guide Dec08.pdf](http://www.wati.org/content/supports/free/pdf/ATResourceGuideDec08.pdf)
- Scherer M., Hart T., Kirsch N., Schulthesis M. (2005), "Assistive technologies for cognitive disabilities, *Crit Rev Phys Rehabil Med*, Vol. 17, No. 3, pp.195–215.
- Spindler, R. (2006), "Teaching mathematics to a student who is blind", *Teaching Mathematics & its Applications*, Vol. 25, No. 3, pp. 120–126
- UNESCO. (1994). The Salamanca Statement and Framework for Action on Special Needs Education. World Conference on Special Needs Education: Access and Quality, Salamanca, Spain, 7-10 June 1994. Oliver, M. (1996). Understanding Disability: from Theory to Practice. Basingstoke: Macmillan. Paris: UNESCO.
- UNICEF (2013), The state of the world's children 2013. Children with disabilities. New York: United Nations Children's Fund
- Wang, H.L (2009),"Should All Students with Special Educational Needs (SEN) Be Included in Mainstream Education Provision? - A Critical Analysis", *International Education Studies*, Vol. 2, No. 4, pp. 1-8.
- WHO. ICF Browser. Chapter 1 Products and technology: World Health Organization; [June 9, 2014]. Available from: <http://apps.who.int/classifications/icfbrowser/>.
- Wiazowski, J. (2009), "Assistive technology for students who are blind or have low vision". In Jill Gierach (Ed.), *Assessing students' needs for assistive technology: a resource manual for school district teams*. Milton, WI: Wisconsin Assistive Technology Initiative.
- Wilson, B.A., Evans, J.J. (1996), "Error-free learning in the rehabilitation of people with memory impairments". *Journal of Head Trauma rehabilitation*, Vol. 1, pp. 54–64.
- Winter, E., and O'Raw, P. (2010). Literature review of the principles and practices relating to inclusive education for children with special educational needs. National Council for Special Education. Trim, Northern Ireland. Retrieved from http://ncse.ie/wp-content/uploads/2014/10/NCSE_Inclusion.pdf

The Impact of FonF Instruction Through Blended Learning on the Students' Meaning Negotiation and Grammar Skills

Hee Yeon KANG

TESOL Department
Hankuk University of Foreign Studies
Seoul, Korea
vaho@naver.com

Chung Hyun LEE

*Professor, Dept. of English Education,
Hankuk University of Foreign Studies
Advisor,
Korea Association of Multimedia-Assisted
Language Learning(KAMALL)
chlee04@hufs.ac.kr*

ABSTRACT

Studies on focus on form (FonF) instruction have received more attention with an emphasis on accuracy and fluency in communication. However, learners' meaning negotiation through blended learning has been less investigated in terms of the different instructions such as a focus on meaning, FonF, and FonF in blended learning. This study aimed to explore the meaning negotiation and language-related episodes (LREs) according to the different instructions in listening and grammar classes. 48 Korean university students were divided into three groups including one control group and two experimental groups in the study. They participated in meaning negotiation tasks via in and outside classroom talks and synchronous chats. Audio recordings, chat logs, interviews and written tasks were used for data collection. The main findings are as follows. The experimental group 2 that was exposed to FonF instruction in blended learning produced more correctly resolved LREs. They also received less incorrectly resolved LREs than the other two groups. The pedagogical implications of FonF instruction in blended learning such as providing appropriate model and learner training are discussed.

Keywords: Focus on form instruction, Blended learning, Meaning negotiation, Language-related episodes

INTRODUCTION

Researches related to focus on form (FonF) instruction have been largely conducted on grammar teaching and learning in the last decades. Some findings indicated that learners developed grammar skills when they were exposed to linguistic input in meaningful activities (Leow, 1997; Lightbown & Spada, 1990; White, 1987; White, 1998). Lightbown and Spada (1990) claimed that grammar should be learned through meaningful ways based on integrated communicative activity which is one of the FonF instruction elements. Learners are required to pay attention to linguistic form through process of noticing and intake of input. It is desirable to provide enhanced input in order to make learners easily notice linguistic input.

To maximize linguistic input, language classroom through listening activities using multimedia technology could be designed including textual ones. Some studies have investigated the effects of textual enhancement on noticing, language development, recall and production through reading and writing skills and activities (Jourdenais, Ota, Stauffer, Boyson, & Doughty, 1995; Lee, 2007; Shook, 1994). There were relatively few studies focusing on listening skills, which can be subject to an argument. Listening has various choices of delivery modes such as aural, audio-visual, and multiple modes of aural-visual-textual through multimedia technology (Plass, Chun, & Leutner, 1998). Studies need to be conducted to examine the procedures on how learners notice input and errors, correct output and interact with their peers. However, most of the studies above on FonF instruction mostly have focused on investigating the effectiveness of instruction.

For successful implementation of FonF instruction, it needs to ensure the sufficient time to be exposed to enriched input and to provide enough opportunities for production. The traditional classroom in English as foreign language (EFL) environments particularly has limitations because of the time and place constraints (Yoon & Lee, 2010). Blended learning could be a possible answer to these limitations as it provides learners numerous benefits of both online and offline environment with flexible modalities and various learning tools (Lee, 2015). Some researchers have attempted to conduct studies on instruction in online and blended learning environments (Baturay, Daloglu, & Yildirim, 2010; Lee & Lee, 2012; So & Lee, 2013; Suh & Lee, 2014; Yoon, 2011). Other studies reported positive effects of peer feedback and language-related episodes (LREs) on collaborative work in online and computer mediated communication environments (Diez-Bedmar & Perez-Paredes, 2012; Ware & O'Dowd, 2008). Very few studies on FonF instruction and grammar in blended learning have been investigated (Baturay, Daloglu, & Yildirim, 2010; Jin, 2014; Pinto-Llorente,

Sánchez-Gómez, García-Peñalvo, & Casillas-Martín, 2017). In addition, there were hardly any studies to examine the meaning negotiations under the condition of FonF in blended learning yet.

The purposes of this study are first, to explore negotiation of meaning in blended learning in terms of frequency and types, and compare them according to three different conditions; traditional classroom, FonF instruction, and FonF instruction in blended learning. The second is to investigate how the learners' LREs were resolved. The research questions for this study are: 1) How does FonF instruction with textual enhancement affect learners' negotiation of meaning and its occurrences between three groups?; and 2) To what extent do learners resolve language-related episodes (LREs) as seen in their written output?

LITERATURE REVIEW

FonF Instruction in EFL

Focus on meaning involves activities that are purely message-focused with no attempt to draw learners' attention to form, while FonFs involve the treatment of grammatical forms in isolation (Long & Robinson, 1998), and FonF attempts to integrate attention to form into a meaning-focused communicative context. Ellis (2001) classified FonF into two types, planned and incidental, which primarily focus on meaning rather than form during the tasks. However, the former is an instruction that involves intensive attention to pre-selected forms, while the latter distributes attention to forms into a wider range of forms. Enriched input and focused communicative tasks are considered to be significant elements for planned FonF implementation (Ellis, 2001).

There are a number of ways to achieve enriched input, which is to have learners notice the target forms in the meaning-focused activities. The first option is to have learners simply listen to or read texts that contain plentiful examples of target features (Ellis, 2001; Trahey & White, 1993). Input flood enriches input in the manner of including numerous examples of the target feature without any function to draw attention to the linguistic form, including when target features are frequently exposed to learners (Trahey & White, 1993). Hernández (2008) argued that simply providing an input-rich environment alone could not lead to learners' acquisition, but they could reach a higher level of proficiency when they are given an input enhancement combined with meaningful, task-essential practice, stressing that opportunities to notice and use the target features in communicative context must be provided. The second is to have learners focus their attention on the target features incidentally in meaning-focused activities. This is called input enhancement, which could be another way of enriching input to reinforce noticing the target forms (Ellis, 2001; Smith, 1993). It involves some attempt to highlight the target features, drawing learners' attention to it. For input to become intake, it must be noticed by the learners (Schmidt, 2001). Enhanced input makes more opportunities for attention and noticing to form. Visual input enhancement, also known as written or textual enhancement, is one of the ways to provide enhanced input to learners to be noticed easily (Ellis, 2001; Smith, 1993). Textual enhancement is an implicit typographical technique of focus on form using emphasizing text such as *colored*, **bolded**, *italicized*, underlined, and CAPITALIZED texts (Labrozzi, 2016; Loewen & Inceoglu, 2016).

A number of studies have investigated positive effects of input enhancement on various aspects such as noticing (Jourdenais, Ota, Stauffer, Boyson & Doughty, 1995), recall (Jourdenais et al., 1995; Lee, 2007), production (Shook, 1994), and comprehension (Chung, 1999, LaBrozzi, 2016). The early study of Jourdenais et al. (1995), examined the effect of textual enhancement designed with underlined and changed font in reading on Spanish L2 learners' noticing of the Spanish preterit and imperfect verb forms, which showed positive effects on noticing target forms and learners' subsequent output. Another positive effect of input enhancement on intake can be found in Shook's (1994) study, where using bolded and capitalized letters of targeted items resulted in a positive effect on intake when attention to enhancement was explicitly told.

On the other hand, some studies found no effect of textual enhancement on intake, acquisition, noticing and comprehension, as well as studies that found mixed effects (Bowles, 2003; Leow, 1997, 2001; Izumi, 2002; Lee, 2007). Leow (1997, 2001) attempted two studies to investigate the effectiveness of textual enhancement, but found no positive effects. Izumi's (2002) study investigated the effects of input enhancement of the acquisition of relative clauses by adults, which showed positive effects on noticing but no effect on learning. This result is similar to a later study that investigated the effects of textual enhancement on acquisition and reading comprehension (Lee, 2007).

Negotiation of Meaning in Peer Feedback through Online and Blended Learning

Text-based chat promotes interaction that plays an important role in the negotiation of meaning (Diez-Bedmar & Perez-Paredes, 2012; Lai & Zhao, 2006; Murphy, 2010; Yilmaz & Granena, 2010). It increases learners'

opportunities to pay attention to form, to take notice of errors, and to make output revised because of its characteristics of the self-paced setting and the visual salience of written discourse (Lai & Zhao, 2006; Lee, 2007; Smith, 2008). For this reason, interaction during online chat is often used in the studies on noticing and feedback. The results of studies on text-based chat found that learners use negotiation strategies similar to the ones used in face to face (FTF) conversation, such as confirmation checking, the first language use, and self-repair to provide and attend to feedback (Lee, 2002; Smith, 2008). There are a number of studies that examined learners' meaning negotiation using multimedia (Diez-Bedmar & Perez-Paredes, 2012; Lai & Zhao, 2006; Murphy, 2010; Ware & O'Dowd, 2008; Yilmaz & Granena, 2010). Lai and Zhao (2006) compared interaction between FTF and online chats. The results showed that online chats enhanced input and promoted the awareness of linguistic errors. A study by Blake and Zyzik (2003) explored the interaction between heritage speakers and second language (L2) learners of Spanish in an online environment, which revealed that participants were able to resolve lexical problems that caused syntactic errors.

However, not all studies support the facilitative role of multimedia on FonF (Iwasaki & Oliver, 2003; Loewen & Erlam, 2006; Loewen & Reissner, 2009). A study by Loewen and Erlam (2006) on corrective feedback in an online chatroom revealed that low level students paid limited attention to linguistic form. In addition, they produced less successful uptake of negotiated forms in online interaction. Loewen and Reissner (2009) compared incidental FonF in an L2 classroom and two types of chat rooms (with and without teacher moderation), and found that FonF appeared much more in the FTF context than in the unmoderated online context.

Online and blended learning as learning environments have been increasingly implemented in EFL contexts. As shown in Table 1, degrees of blended learning can be categorized from previous studies of educational technology and English education below. In the EFL context, the concept of blended learning is generally divided into supplementary and transformational (Lee, 2004). Later Yoon (2011) re-categorized this concept to weak and strong blended learning, which is similar to Graham's (2006) enhancing and transforming blend.

Table 1. Degrees of Blended Learning (Yoon, 2011, p. 239)

	Online only	Online or Offline	Online and Offline (Supplementary)	Online and Offline (Transformational)	Offline only
Lee (2004)	-	-	Online and offline holistic English education		-
Garrison & Kanuka (2004)	-	-	-	Blended learning	-
Graham (2006)		Enabling blend	Enhancing blend	Transforming blend	-
Yoon (2011)			Weak blended learning	Strong blended learning	-

Many studies have investigated the effectiveness of blended learning and peer feedback across different language skills, such as listening (Lee & Lee 2012), reading (Suh & Lee, 2014), reading and feedback (Murphy, 2010), writing (So & Lee, 2013; Yoon 2011), pronunciation (Yoon & Lee, 2010), vocabulary (Jung & Lee, 2013), peer feedback on language form and LREs (Diez-Bedmar & Perez-Paredes, 2012; O'Rourke, 2005; Ware & O'Dowd, 2008), and FonF through meaning negotiation (Yilmaz & Granena, 2010). This study attempted to apply FonF instruction to develop the students' negotiations of meaning and grammar skills through learner interactions and LREs.

METHODOLOGY

Participants

A total of 48 low-level university students in Korea participated in this study. They were divided into three groups, a control group and two experimental groups. As seen in Table 2, 16 participants are assigned to the control group, the experimental group 1 and the experimental group 2 respectively. To observe peer collaboration for negotiation of meaning and forms in a blended learning environment, each group was divided further into four groups. The participants had diverse majors such as Early Childhood Education, Social Welfare, Police Administration, Nursing Science, etc.

Table 2. Participants of each Group

Group	No. of groups	No. of participants
Control Group	4	16

Experimental Group 1	4	16
Experimental Group 2	4	16
Total	12	48

Prior to the treatment, all participants took a grammar judgment test to check the homogeneity between participants. The test results showed there were no significant differences between groups according to ANOVA test ($F=1.820$, $p = .167$).

Data Collection Instruments

The Experiment

This study used an experimental design in order to examine the influence of FonF instruction through enhanced input in blended learning on learners' meaning negotiation and LREs. As seen in Table 3, three groups were exposed to different types of instruction. Firstly, the control group as a traditional listening and grammar class, were taught without FonF instruction and blended learning. Secondly, the experimental group 1 was taught using the planned FonF instruction without blended learning. Finally, the treatment of the second experimental group was planned FonF instruction with blended learning. Details of listening modes, tasks and activities on FonF instruction are elaborated below.

Table 3. Description of Experimental Design

Control group	Experimental group 1	Experimental group 2
without FonF instruction	Planned focus on form instruction	
	Without blended learning	With blended learning

Listening Modes of FonF Instruction

As mentioned earlier, the input enhancement and communicative activities are important elements in FonF instruction. In order to provide abundant linguistic input, the target grammar items were embedded in listening activities with the experimental groups instructed through three multimedia input modes, while the control group received only audio-visual mode. Table 4 shows the different listening modes between the groups. The purpose of the visual mode was to help students predict the story and build meaning before listening, while the text mode was highlighted with colored, bolded, italicized text in order to draw learners' attention to the target features as enhanced input. As shown in Table 4, the listening mode with audio and visual mode was carried out three times in the control group. The learners in the experimental groups were required to complete communicative activities with textual enhancement, based on the three types of modes.

Table 4. The Difference of Listening Modes between Groups

	Control Group	Experimental Group 1 & 2
Listening Modes	Audio + visual *3	Visual Audio + visual Audio + visual + textual enhancement

Students' written tasks on FonF

For the second research question, students' written works based on their listening activities were analyzed to investigate whether they applied peer feedback into their production, and to what extent the feedback were accepted. Both the first and final drafts of the students' written works before and after receiving and providing peer feedback were explored.

Chat-logs and voice recordings

To examine the learners' interaction, chat-logs and recordings were collected to see how learners negotiated meaning and linguistic forms according to the three different instructions. Learners used a voice recorder and a mobile communication tool to record and save as text files. All recordings submitted were transcribed and translated into English. Figure 1 shows an example of interaction in text-based communication tool.

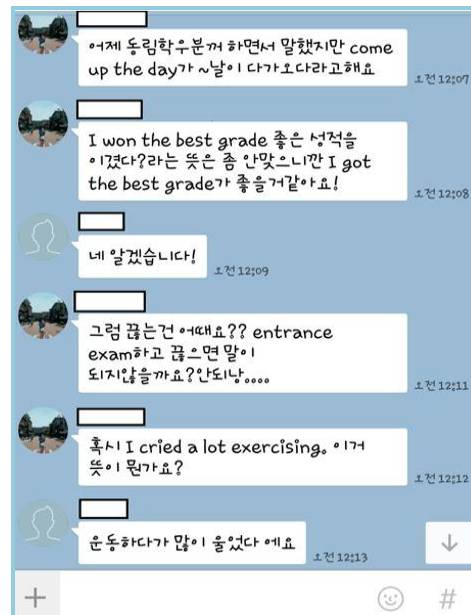


Figure 1. An Example of Learners' interaction in a mobile communication tool

Semi-structured Interviews

Semi-structured interview from the focus groups were conducted to collect the data about learners' feelings, intentions, and thoughts. The interviews were conducted in Korean, based on the chat-logs and students' written works. All interview data were recorded by voice recorders, and were later transcribed and translated into English.

Procedures

This study was conducted from September to November during the 2016 fall semester in a university located in Korea. Students enrolled in 'College English,' which was a two-hour class that was taught once a week. The instruction lasted for nine weeks. The main activities in the classes were listening activities, and the grammar forms in each lesson were included in listening texts and activities. The target forms that were taught in the class are shown in Table 5. The students were given three written tasks as a listening comprehension and grammar tests. Each group consisted of four students as mentioned before. The written tasks featured themes that they were taught, and then the students received and provided peer feedback, which included meaning negotiation. After the group interaction, they revised their own written works with their peers' feedback.

Table 5. The Themes and Grammatical Items

Unit	Themes	Grammatical Items
Unit 1	Food from the Earth	Past tense
Unit 2	Express Yourself	Present perfect tense
Unit 3	Cities	Future with <i>will</i> <i>Will</i> + time clauses
Unit 4	The Body	The comparatives, superlatives
Unit 5	Challenges	Past continuous with the simple past <i>Enough, not enough, too</i> + adjective
Unit 6	Transitions	Using the present perfect tense
Unit 7	Luxuries	Passive voice with <i>By</i>
Unit 8	Nature	Real conditional in the future
Unit 9	Life in the Past	<i>Used to</i>

All three groups were required to complete tasks after their classes. The major difference between the control group, the experimental group 1 and experimental group 2 was that the students in the experimental group 2 were required to complete listening activities in a blended learning environment. Through the listening comprehension activities, the students were exposed to practice on meaning and FonF, and were given written tasks based on the themes in Table 5, aimed to enhance meaning negotiation and grammar skills. The learners in the control group and the experimental group 1 were given grammar practice activities as offline tasks. Only the experimental group 2 was exposed to the blended learning environment. Figure 2 illustrates the different types of tasks and activities between groups according to the experimental design.

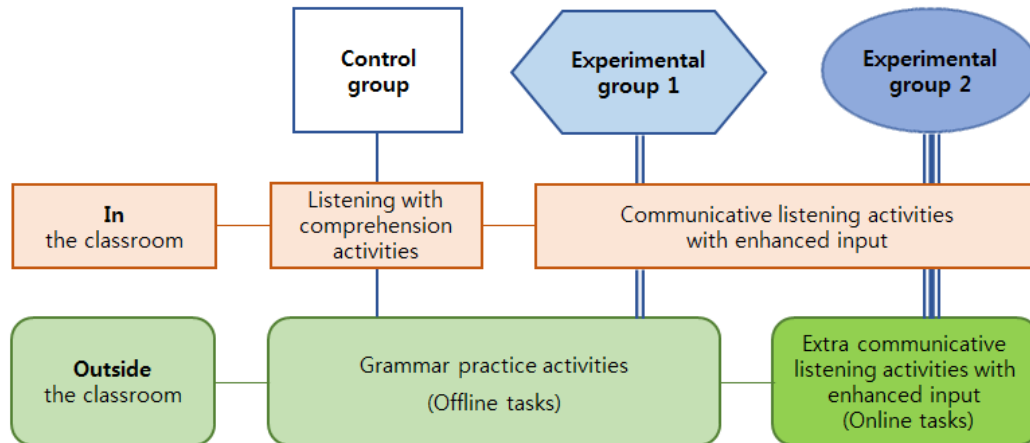


Fig. 2: The Model of FonF Instruction including Task differences between Groups

Data Analysis

The data that was analyzed in this study is the peer feedback including learners' meaning negotiations, its occurrences and LREs for the final written activity of the three that the students completed during the course. To explore the students' meaning negotiation and grammar skills, LREs were identified and analyzed from the chat logs, voice recordings and interviews. LREs were identified and categorized based on Williams (2001), Loewen (2005), and Leeser (2004)'s coding schemes. LREs were categorized into types of linguistic features (grammar, vocabulary, spelling, and meaning), types of resolution (correctly resolved and incorrectly resolved LREs), and types of reception (correct reception and incorrect reception of LREs).

Table 6. LREs Coding Scheme

Categories	Definition	Types
Source	The reason to instigate an LRE	Form-focused (FF) Meaning-focused (MF)
Linguistic feature	Linguistic target	Grammar Vocabulary Spelling
Resolution	Quality of student feedback	Correctly resolved LREs (CR) Incorrectly resolved LREs (ICR)
Reception	Students' reaction to feedback	Reception Non-reception

Each LRE was first categorized into form-focused (FF) or meaning-focused (MF) LREs depending on their sources. In particular, FF LREs were coded under three types of linguistic features, grammar, vocabulary, or spelling. Finally, all FF LREs were labeled as either correctly or incorrectly resolved LREs. As for the reception, both FF and MF LREs were divided in the correctly resolved and incorrectly resolved LREs. An example of LREs coding is shown below.

Table 7. Example coding of LREs (in the discussion about Min's essay)

		Coding	Types
Hyun	Min, what does it mean ' <i>The zoo is very different animals and big</i> '?	Source	MF
Min	It means '그 동물원의 동물들이 매우 다양하고 컸다' (The animals in the zoo were various and so big.)		
Hyun	Then, I think 'animals' should be a subject in the sentence.	Source LF Resolution Reception	FF Grammar CR Reception
Min	Ohhhhh! Thank you!		
Hwan	I agree with Hyun's idea. 'The animals of zoo is* very big and various' would be better. 'various' is more appropriate than 'different.'	Source LF LF Resolution Reception	FF Grammar Vocabulary ICR Reception
Hyun	Ohhh. Good!		
Min	Thank you, guys!		

LF: linguistic feature, "*" refers to incorrect language use.

All data were coded and categorized by two researchers. Pearson's r was used to estimate the consistency between two raters, and was over 0.9 ($p = 0.01$).

RESULTS AND DISCUSSION

Influence of FonF in Learners' Interaction Types and Occurrences

To answer the first research question, a total of 234 of LREs produced by learners were analyzed to investigate meaning negotiation in a blended learning environment in terms of frequency and types, and to compare them between groups. Table 8 shows the number of LREs in each group of students in both experimental groups and the control group. 68 LREs from the control group, 113 LREs from the first experimental group, and 72 LREs from the second experimental group were produced. Group 8 in the first experimental group produced the highest number of LREs (27 LREs), while group 1 in the second experimental group produced the least number of LREs (10 LREs).

Table 8. Number of LREs in each group

Groups	Group no.	No. of LREs	No. of Total LREs
Experimental group 2	Group 1	10	72
	Group 2	25	
	Group 3	18	
	Group 4	19	
Experimental group1	Group 5	15	94
	Group 6	26	
	Group 7	26	
	Group 8	27	
Control group	Group 9	22	68
	Group 10	21	
	Group 11	12	
	Group 12	13	
Total LREs			234

Table 9 shows the number of LREs from different groups categorized depending on their sources; a total of 219 FF LREs and 34 MF LREs were produced. Of these LREs, 55 FF LREs produced by the control group, 97 FF LREs by the first experimental group, and 67 FF LREs by the second experimental group. 13 MF LREs, 16 MF LREs, and 5 MF LREs were produced by the control group, experimental group 1, and experimental group 2 respectively. From this data it is clear that the second experimental group had the highest occurrence of FF LREs with 93.1%, followed by the first experimental group with 85.8% and the control group with 80.9%. The control group, on the other hand, had the highest occurrence of MF LREs with 19.1%. This means that the learners in the experimental group 2 produced more FF LREs than those of two other groups, while producing MF LREs at a lowest percentage.

Table 9. Number of FF and MF LREs in each group

	No. of FF	No. of MF	Total
Control group	55 (80.9%)	13 (19.1%)	68
Experimental 1	80 (85.1%)	14 (14.9%)	94
Experimental 2	67 (93.1%)	5 (6.9%)	72
Total	204 (87.2%)	30 (12.8%)	234

An explanation for the higher production of MF LREs in the control and the first experimental group could be the learners' lack of confidence in their grammar abilities. Evidences for these were found in their chat-logs and their interviews, with some students explicitly expressing doubt on their language ability, as shown below.

Excerpt 1 [from the chat-log of group 7 in experimental group 1]

Donghoon: Um.... I'm not confident about grammar. So, I may give feedback on vocabulary and meaning. Sorry.

Suji: Me too. I'll give more feedback on meaning.

Excerpt 2 [from the chat-log of group 10 in the control group]

Jaehoon: Do we have to give feedback on only grammar?

Jinhee: Not necessarily. I think it doesn't matter. You can also give feedback on anything. Vocabulary, meaning, spelling, even punctuation.

Jaehoon: Oh! Then I will focus on content or vocabulary because I'm not confident about grammar.

Excerpt 3 [from Jahoon's interview]

Jahoon: I'm not good in English, so I'm not confident about grammar. I couldn't give feedback on grammar to my group members, because I couldn't judge which one was correctly written or not. However, I could search vocabulary an online dictionary. For example, when I typed 'Sashimi in English' in Korean in the search box of the online dictionary, the words appeared. I chose one, and then gave feedback. However, in case of grammar, I couldn't find anything.

Excerpt 4 [from Donghee's interview]

Donghee: I received feedback from members a lot. They were very helpful. I was sorry that I couldn't give feedback to my peers because of my poor English. So, I focused on the meaning. This way I didn't have to correct the sentences, and just gave comments. For example, 'how about adding time and data in detail?' or 'How about adding some more detail on explaining the experience?'

Along with their lack of confidence in grammar, from the interviews of excerpts 3 and 4, it seemed that it was easier for some students to give feedback on vocabulary than on grammar as the students could find synonyms and alternative words by using online dictionaries. Further analysis of the LREs relating to linguistic features such as grammar, vocabulary, and spelling is shown in table 10.

Table 10. Number of LREs and Percentages in Linguistic Features

	Grammar	Vocabulary	Spelling	Total
Control group	42 (76.4 %)	11 (20 %)	2 (3.6 %)	55
Experimental group 1	58 (73.5 %)	20 (25 %)	2 (2.5 %)	80
Experimental group 2	53 (79.1%)	11 (16.4%)	3 (4.5 %)	67
Total	155 (76 %)	42 (20.6%)	7 (3.4 %)	204

The total number of LREs produced by the three groups on grammar was 155, with vocabulary and spelling related LREs occurring 42 and 7 times. Among them, 42 LREs, 60 LREs and 53 LREs were addressed by the control group, experimental group 1, and experimental group 2 respectively in terms of grammar. As for the vocabulary, the control group produced 11 LREs, while experimental groups 1 and 2 produced 20 and 11 LREs. In terms of spelling LREs, the control group produced 2, with the first and second experimental groups producing 2 and 3 respectively. The experimental group 2 had the highest percentage on grammar LREs whereas the experimental group 1 produced the highest percentage of vocabulary LREs with 24.4%.

Combining the data from tables 9 and 10 shows a result that is contrary to previous studies (Blake & Zyzik, 2003; Lee, 2007; Morris, 2002), which showed lexical problems were the triggers for negotiations of meaning than syntactic errors. A possible explanation of this result may be the characteristic of the final written activity given to the students. A theme such as “Life in the Past” is likely to prompt students to use the past tense to express their memories, making students devote extra attention to FonF while giving feedback. The LREs from the control group and the first experimental group mostly focused on verb tense, while the second experimental group included a wider range of linguistic forms such as the present perfect, prepositions, superlatives, past continuous and the passive voice. This is evident from the below excerpts.

Excerpt 5 [from the chat-log of group 6 in experimental group 1]

Minwoo: This verb doesn't look correct.

Heejae: This one?

Minwoo: Yeah. I think it is 'visited' instead of 'visit'.

Heejae: Oh! Thank you.

Excerpt 6 [from the chat-log of group 4 in experimental group 2]

Sihoon: In Bohee's writing, I think you should add 'to' in the sentence 'I used go to the park.' You remember 'used to' that we learned it in Unit 9?

Bohee: Oh! I remember.

Excerpt 7 [from the chat-log of group 9 in control group]

Sukhyun: Remember from Unit 1, we learned that the 'eat' is an irregular?

Hyejin: That's right. So it's not 'eated' here.

Ido: Ah, it's 'ate'. Thank you so much guys!

Among the LREs produced by learners, the occurrence and percentages of correctly resolved LREs (CR LREs) and incorrectly resolved LREs (ICR LREs) are shown in Table 11. From 202 LREs on linguistic features, 160 LREs were categorized into CR LREs while 38 LREs were in ICR LREs. The percentage of CR LREs produced by Experimental group 2 was the highest with 91% followed by the experimental group 1 with 76.3% and the control group with 69.1%. In terms of ICR LREs, the control group had the highest occurrence with 30.9% while the lowest percentage was in the experimental group 2 (9%).

Table 11. Number of and Percentages in CR and ICR LREs

	CR LREs	ICR LREs	Total
Control group	38 (69.1%)	17 (30.9 %)	55
Experimental group 1	61 (76.3%)	19 (23.8%)	80
Experimental group 2	61 (91%)	6 (9%)	67
Total	160 (81.4%)	42 (18.6%)	202

This result indicates that the second experimental group had more opportunities to produce language and exposure to linguistic input while carrying out the activities. It appears that learners' noticing is activated more with textual enhancement, which can result in intake. Furthermore, the learners in this group had greater linguistic input during the communicative activities in the non-threatening environments of blended learning, resulting in fewer ICR LREs than the other two groups. It is plausible that this is related to their increased focus on a wider range of grammar in their peer feedback, as shown in excerpts 8 and 9 below.

Excerpt 8 [from the chat-log of group 4 in experimental group 2]

Juhee: What language points should we focus on?

Daeun: Anything is OK. I think we should focus on grammar points that we learned in the class.

Juhee: That's good idea. I'll try use the language point we learned as much as possible.

Excerpt 9 [from the chat-log of group 1 in experimental group 2]

Woosik: According to Unit 5, I think you should use past continuous in while clause. Isn't it? (to Bohee)

Sihoon: Oh!! I agree with Woosik. I remember that. We must use past continuous in while clause after past tense.

Bohee: Thank you guys! I'll revise it.

The Frequencies and Percentages of Feedback Reception from LREs

The second research question asks to what extent learners apply their peers' feedback to their writing production, to investigate how much of the LREs were received. A total of 234 LREs were analyzed according to source, linguistic feature, resolution, and groups. Of these 234 LREs, 183 LREs were received by the learners when revising their writing while 51 LREs were not. In MF LREs, 20 LREs were applied to their resolution with 62.5%. 163 FF LREs were categorized into reception LREs while 39 FF LREs were in non-reception LREs types. Table 12 shows the frequencies and percentage of the acceptance of feedback in terms of MF and FF LREs in detail. Comparing MF and FF LREs, the percentage of reception in FF LREs was over 80 while that of MF LREs accounted for a lower percentage with 62.5 %. The percentage of non-reception in MF LREs is relatively higher than that of FF LREs.

Table 12. The Frequencies and Percentages of the LRE reception in Source

	Reception	Non-reception	Total
MF LREs	20 (62.5%)	12(37.5%)	32
FF LREs	163(80.7%)	39(19.3%)	202
Total	183(78.2%)	51(21.8%)	234

This means that the learners tended to apply their peer feedback on form more than meaning, and it appears that they were more confident about their stories because they were writing about themselves (as per the topic "Life in the past"). There even were some cases where the students misunderstood the stories and gave incorrect feedback. This kind of feedback was not accepted by the student who wrote the story, as seen in excerpt 10.

Excerpt 10 [from the chat-log of group 1 in experimental group 2]

Woosik: According to Unit 5, I think you should use past continuous in while clause. Right? (to Bohee)

Sihoon: Oh!! You're right. I remember that. We must use past continuous in while clause after past tense.

Bohee: Thank you guys! I'll change it.

(few minutes later)

Bohee: Ummm. I used 'while' to express meaning of 'whereas' not 'during'. In this situation, do I have to use past continuous too?

Woosik: Oh really? I misunderstood. In that case, I'm not sure.

Sihoon: I just searched the example sentences used 'while' when it is used to express 'whereas'. Seeing the example sentence 'Some people like juice, while others don't.', you don't have to use continuous.

Bohee: Oh! Thank you. Then I'll just leave my original sentence.

Woosik: Good!

Another explanation for this is the students feeling burdened to write extra sentences. It seems that FF LREs were received more because they were provided in revised forms and therefore were easier to be corrected, since they could be directly applied to the learners' writing with minimal checking and editing. The MF LREs were provided in comments, requiring students to take note of the important points and later add or completely change their sentences for a more detailed expression. This explanation on why students seemed to receive MF LREs less seems adequate, considering the below excerpt from an interview with one of the students.

Excerpt 11 [from Young's interview]

Interviewee: Why didn't you accept Minh'o's feedback? He commented it would be better if you added extra information about your trip.

Young: Well...He gave me very informative feedback. Actually, I wanted to write more but it takes too much time and effort.

The LREs received in terms of linguistic features included 120 grammar LREs, 36 vocabulary LREs, and 7 spelling LREs. A 21.6% of total 153 grammar LREs and 14.3% of vocabulary LREs were not applied to their resolution as shown as Table 13. In terms of resolution, 163 LREs were received, while 39 LREs were not. Both CR and ICR LREs had high percentages of reception with 81.3% of 160 CR LREs and 78.6% of 42 ICR LREs. It is noteworthy to mention here that learners accepted not only correctly resolved feedback but also a large amount of incorrectly resolved feedback and will be elaborated in detail later.

Table 13. The Frequencies and Percentages of LRE Reception in Linguistic Features & Resolution

		Reception	Non-reception	Total
Linguistic Features	Grammar	120 (78.4%)	33 (21.6%)	153
	Vocabulary	36 (85.7%)	6 (14.3%)	42
	Spelling	7 (100%)	0	7
	Total	163(80.7%)	39(19.3%)	202
Resolution	CR LREs	130 (81.3%)	30(18.8%)	160
	ICR LREs	33(78.6%)	9(21.4)	42
	Total	163(80.7%)	39(19.3%)	202

Table 14 presents the frequencies and percentages of received LREs. All three groups had higher percentage of reception of LREs than rejected LREs. 83.19 % of LREs produced by the second experimental group, 75.5% of LREs by the first experimental group and 77.9 % of LREs by the control group were received. The experimental group 2 had the highest reception percentage and the lowest percentage of non-reception.

Table 14. The Frequencies and Percentages of LRE Reception in Groups

	Reception	Non-reception	Total
Control group	53 (77.9%)	15 (22.1)	68
Experimental group 1	71(75.5%)	23(24.5%)	94
Experimental group 2	59 (83.19%)	13 (18.1%)	72
Total	183(78.2%)	51(21.8%)	234

To compare how many ICR LREs were received by the groups, LREs of the three groups were divided into CR and ICR LREs and were then categorized under the two types of LRE receptions. Table 15 shows LRE reception and non-reception in CR and ICR LREs by groups. Generally, the ratio which learners accepted their peers' feedback is much higher than those of non-reception regardless of resolution. Comparing LRE reception between groups, the control group and the experimental group 1 had much more ICR LREs that were received into learners' resolution. It means that the learners in the control group and experimental group 1 produced many more ICR LREs and applied incorrect feedback from their peers to their production.

Table 15. The Frequencies and Percentages of Reception & Non-Reception according to CR & ICR LREs in Groups

Group	CR/ICR LREs	Receive/NReceive	No. (Perc.)
Control group (no. of LREs =55)	CR LREs (n=38)	Received	32 (84.2%)
		Not received	6 (15.8 %)
	ICR LREs (n=17)	Received	14 (82.4 %)
		Not received	3 (17.6 %)
Experimental group 1 (no. of LREs =80)	CR LREs (n=61)	Received	46 (75.4 %)
		Not received	15 (24.6 %)
	ICR LREs (n=19)	Received	16 (84.2 %)
		Not received	3 (15.8 %)
Experimental group 2 (no. of LREs =67)	CR LREs (n=61)	Received	52 (85.2%)
		Not received	9 (14.8)
	ICR LREs (n=6)	Received	3 (50%)
		Not received	3 (50%)

The discussions of the above results from the tables 13, 14, and 15 are as follows. Earlier it was noted that students applied a large amount of incorrectly resolved feedback. It can be seen that they were being accepted regardless of language features and the percentages of their LRE reception in the control and the first experimental group is quite high. It appears that the students in these groups applied incorrect feedback to their drafts without correcting it first, while making ICR LREs more than the second experimental group.

Excerpt 12 [from Yuri's interview]

Interviewee: Did you have any criteria when accepting and rejecting the feedback?

Yuri: No, I didn't.

Interviewee: Then, what feedback did you accept?

Yuri: I applied all the feedback from peer to my revision.

Interviewee: Did you think the feedback you received was correct?

Yuri: Yes, I thought all of them were correct. Were they incorrect?

Interviewee: Some of them were.

Yuri: I didn't know that. Everyone in my group is better than me, so I thought the feedback I received were all correct.

As the above excerpt shows, a student (from the control group) was unaware of the accuracy of the feedback and applied it to her final draft, even though most of the feedback was incorrect. She seemed to entirely rely on her peers' comments. This is a case that requires attention, because peer feedback and interactions influenced the students negatively. Similar cases may have happened in other groups of the control and even in the first experimental group, but learners in the second experimental group seemed to use and apply peer feedback selectively. Excerpt 10 presented previously shows this, as the students from group 1 of experimental group 2 are seen negotiating forms after receiving incorrect feedback. What's more, they even searched example sentences from an online dictionary together, prior to the correction. This can be considered as evidence to the effectiveness of the treatment and different modes that the second experimental group was exposed to. The students in this group had insight on finding information online during the treatment, and this explains why considerably fewer ICR LREs were received to a certain extent.

CONCLUSIONS AND IMPLICATION

This study aimed to explore the meaning negotiations and grammar skills through blended learning according to the different instructions in terms of frequency and types of LREs, and to examine how much of the peer feedback received during the interactions were accepted. The results pertaining to the first research question were as follows: 1) The percentage of MF LREs was highest in the control group, then experimental group 1, both of which were much higher than the experimental group; 2) All three groups produced mostly FF LREs on grammar followed by vocabulary and spelling; and 3) The percentage of CR LREs produced by the second experimental group was much higher than the other two groups. As for the second research question: 1) The FF LREs were received more than the MF LREs; and 2) The percentages of reception in ICR LREs by the control and experimental group 1 were much higher than the experimental group 2.

The higher production of MF LREs was attributed to the lack of confidence of grammar, and the higher CR production indicated effective noticing. The students from the second experimental group received fewer ICR LREs because they were able to apply their feedback selectively, as well as checking and finding information online. The implication from these results is that when FonF listening instruction is combined with input enhancements and blended learning based on the model and the modes featured in this study, it will positively affect the students. Another implication of this study is in regards to peer feedback, especially for low-level students. It was found that some learners may have struggled due to their lack of ability to discern correct and incorrect feedback or even interact with their peers. This could be remedied by inducing teacher intervention within the limits of monitoring, supporting and guiding the students, or by training the students on how to interact with peers and search information on language use and choose the correct forms. Preparation of a training session before the students start to interact should be considered. Finally, this study only shows the pattern difference of interactions between groups. A further study detailing and focusing on a true experiment, showing the effects of blended learning on the development of learners' listening and grammar skills is required.

REFERENCES

- Baturay, M., Daloglu, A., & Yildirim, S. (2010). Language practice with multimedia supported web-based grammar revision material. *ReCALL*, 22(3), 313-331.
- Blake, R. J., & Zyzik, E. C. (2003). Who's helping whom?: Learner/Heritage-Speakers' networked discussions in Spanish. *Applied linguistics*, 24(4), 519-544.
- Bowles, M. (2003). The effects of textual input enhancement on language learning: An online/offline study of fourth-semester Spanish students. In: P. Kempchinski & P. Pineres (Eds.), *Theory, practice, and acquisition: Papers from the 6th Hispanic Linguistic Symposium and the 5th Conference on the Acquisition of Spanish and Portuguese* (pp. 359-411). Somerville, MA: Cascadia Press.
- Chung, J. M. (1999). The effects of using video texts supported with advance organizers and captions on Chinese college students' listening comprehension: An empirical study. *Foreign Language Annals*, 32(3), 295-308.
- Diez-Bedmar, M. B., & Perez-Paredes, P. (2012). The types and effects of peer native speakers' feedback on CMC. *Language Learning & Technology*, 16(1), 62-90.
- Doughty, C. (2001). Cognitive underpinnings of focus on form. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 206-257). Cambridge: Cambridge University Press.
- Doughty, C., & Williams, J. (Eds.). (1998). *Focus on form in classroom second language acquisition*. Cambridge: Cambridge University Press.
- Ellis, R. (2001). Investigating form-focused instruction. In R. Ellis (Ed.), *Form-focused instruction and second language learning* (pp. 1-46). Malden, MA: Blackwell.
- Ellis, R. (2006). Current issues in the teaching of grammar: An SLA perspective. *TESOL Quarterly*, 40(1), 83-107.
- Fotos, S., & Nassaji, H. (Eds.). (2007). *Form focused instruction and teacher education: Studies in honour of Rod Ellis*. Oxford: Oxford University Press.
- Graham, C. R. (2006). Blended learning systems: definition, current trends, and future directions. In C. J. Bonk & C. R. Graham (Eds.), *The Handbook of blended learning: Global perspectives, local designs* (pp. 3-21). San Francisco, CA: Pfeiffer Publishing.
- Hernández, T. (2008). The effect of explicit instruction and input flood on students' use of Spanish discourse markers on a simulated oral proficiency interview. *Hispania*, 665-675.
- Hinkel, E., & Fotos, S. (2002). *New perspectives on grammar teaching in second language classrooms*. Mahwah, NJ: Routledge.
- Izumi, S. (2002). Output, input enhancement, and the noticing hypothesis: An experimental study on ESL relativization. *Studies in Second Language Acquisition*, 24, 541-577.
- Iwasaki, J., & Oliver, R. (2003). Chat-line interaction and negative feedback. *Occasional Thematic Issue of the Australian Review of Applied Linguistics*, 17, 60-73.
- Jourdenais, R., Ota, M., Stauffer, S., Boyson, B., & Doughty, C. J. (1995). Does textual enhancement promote noticing? A think-aloud protocol analysis. In R. Schmidt (Ed.), *Attention and awareness in foreign language learning* (pp. 183-216). Honolulu: University of Hawaii Second Language Teaching & Curriculum Center.
- Jin, S. H. (2014). Implementation of smartphone-based blended learning in an EFL undergraduate grammar course. *Multimedia-Assisted Language Learning*, 17(4), 11-37.
- LaBrozzi, R. M. (2016). The effects of textual enhancement type on L2 form recognition and reading comprehension in Spanish. *Language Teaching Research*, 20(1), 75-91.
- Lai, C., & Zhao, Y. (2006). Noticing and text-based chat. *Language Learning & Technology*, 10(3), 102-120.
- Lee, C. H. (2004). *A study on the development and implementation of an online/offline-based whole English language education program*. 2002 final research report for Korea Research Foundation: Daejeon,

Woosong University.

- Lee, C. H. (2015). *Principles and applications of multimedia-assisted language learning*. Seongnam: Bookorea.
- Lee, J., & Lee, C. H. (2012). Students' perspectives and the effectiveness of blended learning in L2 listening at university level. *Multimedia-Assisted Language Learning*, 15(1), 29-89.
- Lee, S. K. (2007). Effects of textual enhancement and topic familiarity on Korean EFL students' reading comprehension and learning of passive form. *Language learning*, 57(1), 87-118.
- Leeser, M. J. (2004). Learner proficiency and focus on form during collaborative dialogue. *Language Teaching Research*, 8(1), 55-81.
- Leow, R. (1997). The effects of input enhancement and text length on adult L2 readers' comprehension and intake in second language acquisition. *Applied Language Learning*, 8, 151-182.
- Leow, R. (2001). Do learners notice enhanced forms while interacting with the L2? An online and offline study of the role of written input enhancement in L2 reading. *Hispania*, 84, 496-509.
- Lightbown, P., & Spada, N. (1990). Focus on form and corrective feedback in communicative language teaching: Effects on second language learning. *Studies in Second Language Acquisition*, 12, 429-448.
- Loewen, S. (2005). Incidental focus on form and second language learning. *Studies in Second Language Acquisition*, 27, 361-386.
- Loewen, S., & Erlam, R. (2006). Corrective feedback in the chatroom: An experimental study. *Computer Assisted Language Learning*, 19(1), 1-14.
- Loewen, S., & Inceoglu, S. (2016). The effectiveness of visual input enhancement on the noticing and L2 development of the Spanish past tense. *Studies in Second Language Learning and Teaching*, 6(1), 89-110.
- Loewen, S., & Reissner, S. (2009). A comparison of incidental focus on form in the second language classroom and chatroom. *Computer Assisted Language Learning*, 22(2), 101-114.
- Long, M. H. (1991). Focus on form: A design feature in language teaching methodology. In K. de Bot, R. Ginsberg, & C. Kramsch (Eds.), *Foreign language research in cross-cultural perspective* (pp. 39-52). Amsterdam: John Benjamins.
- Long, M., & Robinson, P. (1998). Focus on form: Theory, research and practice. In C. Doughty & J. Williams (Eds.), *Focus on form in classroom second language acquisition*, (pp. 15-63). Cambridge: Cambridge University Press.
- Morris, F. (2002). Negotiation and recasts in relation to error types and learner repair. *Foreign Language Annals*, 35(4), 395-404.
- Murphy, P. (2010). Web-based collaborative reading exercises for learners in remote location: The effects of computer-mediated feedback and interaction via computer-mediated communication. *ReCALL*, 22(2), 112-134.
- O'Rourke, B. (2005). Form-focused interaction in online tandem learning. *CALICO Journal*, 22(3), 433-466.
- Pinto-Llorente, A. M., Sánchez-Gómez, M. C., García-Peñalvo, F. J., & Casillas-Martín, S. (2017). Students' perceptions and attitudes towards asynchronous technological tools in blended-learning training to improve grammatical competence in English as a second language. *Computers in Human Behavior*, 72, 632-643.
- Plass, J. L., Chun, D. M., Mayer, R. E., & Leutner, D. (1998). Supporting visual and verbal learning preferences in a second-language multimedia learning environment. *Journal of educational psychology*, 90(1), 25.
- Schmidt, R. (2001). Attention. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 3-32). Cambridge: Cambridge University Press.
- Smith, M. S. (1993). Input enhancement in instructed SLA. *Studies in second language acquisition*, 15(2), 165-179.
- Swain, M., & Lapkin, S. (1995). Problems in output and the cognitive processes they generate: A step towards second language learning. *Applied linguistics*, 16(3), 371-391.
- So, L., & Lee, C. H. (2013). A case study on the effects of an L2 writing instructional model for blended learning in higher education. *Turkish Online Journal of Educational Technology-TOJET*, 12(4), 1-10.
- Shook, D. J. (1994). FL/L2 Reading, Grammatical Information, and the Input-to-Intake Phenomenon. *Applied Language Learning*, 5(2), 57-93.
- Suh, E. J., & Lee, C. H. (2014). A case study of elementary school students' English reading strategy use in blended learning. *Primary English Education*, 20(4), 297-320.
- Trahey, M., & White, L. (1993). Positive evidence and preemption in the second language classroom. *Studies in Second Language Acquisition*, 15, 181-203.
- Ware, P., & O'Dowd, R. (2008). Peer feedback on language form in telecollaboration. *Language Learning & Technology*, 12(1), 43-63.
- Wesche, M. (1992). French immersion graduates at university and beyond: What difference has it made? *Paper presented at the Georgetown University Round Table on Languages and Linguistics*, Washington, DC.
- White, J. (1998). Getting the learners' attention: A typographical input enhancement study. In C. Doughty & J. Williams (Eds.) *Focus on form in classroom second language acquisition*. Cambridge, English:

Cambridge University Press.

- White, L. (1987). Against comprehensible input: The input hypothesis and the development of second language competence. *Applied Linguistic*, 8, 95-110.
- Williams, J. (2001). The effectiveness of spontaneous attention to form. *System*, 29, 325-340.
- Yilmaz, Y., & Granena, G (2010). The effects of task type in synchronous computer-mediated communication. *ReCALL*, 22(1), 20-23.
- Yoon, S. Y. (2011). Students' reflection on feedback in L2 writing in blended learning. *Multimedia-Assisted Language Learning*, 14(2), 235-261.
- Yoon, S. Y., & Lee, C. H. (2010). The perspectives and effectiveness of blended learning in L2 writing of Korean university students. *Multimedia-Assisted Language Learning*, 13(2), 177-204.

ACKNOWLEDDGEEMENT

This work was supported by Hankuk University of Foreign Studies Research Fund of 2017.

The Impact of Principles in Learning and Teaching of Professional English in Multilingual Context

Saltanat MEIRAMOVA

*International Cooperation and Multilingual
Education Development Center
S. Seifullin Kazakh Agrotechnical University
saltanat-64@mail.ru*

Damina SHAIBAKOVA

*Abay Kazak National Pedagogical University
Kazakhstan*

ABSTRACT

Doughty and Long (2003) define methodological principles as a list of design features that can be generally regarded as being facilitative to second/foreign language acquisition. The purpose of this paper is to explore the impact of principles in learning and teaching of professional English methodology in the context of task-based approach. Further, the paper attempts to develop some theoretical underpinnings of those developed eight principles underlying the methodology of professional English teaching and demonstrates how such approaches might be implemented in the multilingual context in the Republic of Kazakhstan.

INTRODUCTION

According to the national idea of "Mangilik El", the formation of the 21st century should be based on new methodology for humanitarian research. This national idea is harmoniously intertwined with priority directions in the field of education and science of the Strategy "Kazakhstan-2050" and is reflected in Nation Plan - 100 concrete steps. Here, provision of high quality foreign education in the context of multilingualism in the universities of agrarian system in Kazakhstan, in particular professional language teaching is acquiring important significance. Previous studies, namely, the role of foreign language in personal development (Bim, 2002, Zimnyay, 1999), the influence of language education on development of professionally significant qualities of teacher (Kunanbayeva, 2014, Alekhin, 2017) will serve as a basis for defining teaching concept. In addition, this reflects our intention to address the new challenges and opportunities in the field of higher education and integration with the Bologna process. In this context much have been done in modernisation of the national higher educational system to make it competitive on the international level and foster its quality and relevance by implementing higher education reforms along the general lines of the Bologna process.

Methodological principles in English teaching and learning have been recognized as important to the educational experience of students to use language for the purpose of communication and to participate in intercultural interaction in the multilingual context in Kazakhstan. According to the annual Message of the President of Kazakhstan N.A. Nazarbaev (31.01.2017) to Kazakhstan people "The third modernization of Kazakhstan: the global competitiveness" in the fourth priority regarding the upgrading of the human capital, it is mentioned that it is necessary to change the role of the system of education, where the objective is to make the education as the central chain of the new model of the economic growth. The focus should be paid to the educational programs which should aim at the development of critical thinking and skills of independent information search on the basis of the principles of learning and teaching.

The main important thing is to step-by-step approach to the trilingual education where the Kazakh will play the dominant role and English will be the language of the new technologies to promote Kazakhstan to reach the nationwide progress. In this context the peculiar attention will be paid to the English teachers' professional competency which requires considering the policy of stepwise implementing of English.

In other words, the trend for providing everyone in Kazakhstan with a good command of English for international intercourse has become very prominent in the Republic of Kazakhstan, as multinational country, where hundreds of thousands of people are learning English for improving their life prospects and meet the requirements of current 'English language education' there.

According to Hornberger (2009): “Multilingual education is, at its best, multilingual in that it uses and values more than one language in teaching and learning, intercultural in that it recognizes and values understanding and dialogue across different lived experiences and cultural worldviews, and education that draws out, taking as its starting point the knowledge students bring to the classroom and moving toward their participation as full and indispensable actors in society – locally, nationally, and globally”. It is obvious that multilingual education is a very complex term, which needs to be studied from different points.

In this light multilingualism in Kazakhstan is considered as a multipurpose system which covers the issues of social sciences, and linguistics as well to be solved pragmatically, as well on the educational and cultural levels. Consequently, Kazakhstani foreign education is shifting from “knowledge as contemplation” to “knowledge as operation” (Barnett, 2001). In this light, we have defined 8 methodological principles based on best home and foreign practice and experience to help students to develop new knowledge, form critical thinking and take-decision skills to effectively play in any nonstandard situations in the real life. In other words, we refer to the so-called “provisional specifications” (Stenhouse, 1975) which provide teachers with a basis for argument and for reflection and relevant to be applied in a variety of settings, including foreign and professional English language situations and content-based classrooms.

The current state of teaching professional English in Kazakhstan does not meet the requirements of today; therefore, modernization of foreign higher education is required, aimed at developing professional competencies in a foreign language teaching along with implementation of lifelong learning principles as well. Thus, the focus of this paper is to define a set of teaching/learning principles which will be described and discussed in the logic consequences by focusing on their essence and meaning, the reasons for defining them, and suggestions of their implementation in the professional English classrooms afterwards.

This paper is written within the research project № 2546/ТФ4 implementation funded by Ministry of Education and Science of the Republic of Kazakhstan on 2015-2017.

THE STUDY

Modern Kazakhstan is a multi-ethnic and poly-confessional state which is developing in the conditions of multilingualism, and language learning is one of the main indicators of adaptation to the new social-political and social-cultural realities. In this regard, the higher school professional faces a task - to teach students to critically approach a problem solving, to overcome problems posed by life; to be able to systematically, analytically and critically evaluate the consequences of their actions and be willing to take responsibility for their choices in problem solving. Hence, it has to be reoriented in terms of developing professional qualities that is in tandem with the process of professional English language teaching in the context of multilingualism.

During the implementation of project’s purpose and tasks, the three-stage TBLT model (Meiramova, 2012) has been developed for the profession-oriented English teaching on the basis of cognitive – communicative approach and Task-Based Learning and Teaching (TBLT) approach in the context of multilingual education. In addition, the textbook on English for Science and Technology for Multilanguage education students has been developed as well, aimed to increase the effectiveness of learning and teaching by expanding the vocabulary of the individual, along with the formation of cognitive mentality and critical thinking, which are now the cornerstone of the modern methodology of professional English language teaching in the Kazakhstani universities.

The authors state that the following below 8 defined Principles underpin the mentioned three-stage TBLT model and could be introduced through the modeling (Karl Kaliski and Derrin Kent, 2001) i.e. so-called ‘lesson shape’ which guarantee the student’s basic academic development (e.g., capacity to analyze and synthesize, language awareness, critical thinking, research abilities, etc.).

Principle 1: Use Task-Based Learning and teaching (TBLT) as Classroom Management Principle

TBLT could be considered as ‘learning by doing’ which is strongly supported by an active approach to using target language along with Willis’ (1996, p.23) definition of a task as ‘activities where the target language is used by the learner for a communicative purpose (goal) in order to achieve an outcome’.

Principle 2: Promote Meaningful, Comprehensible, and Elaborated Input for Successful Acquisition

Krashen's (1985) view of a successful acquisition is motivation and "comprehensible input", because input provides the implicit knowledge on the basis of rich authentic materials reflecting real-life situations and pedagogical demands and maximises the use of the target language. Further, the information teacher processes must be meaningful, i.e. presented clearly and relatable to prior knowledge that the learner already possesses. In addition, the prior knowledge must be organized in such a way that the new information could be easily "attached" to the learner's cognitive structure (Ausubel, 1968).

Principle 3: Promote Classroom Dynamics Learning

Teachers should try to motivate their students to be effectively involved in the socializing process in the classroom through whole class interaction, small group interaction, interaction in pairs and individually according to the type of used activities. By and large interaction is a tool for helping learners to acquire new language and is viewed as a primary source of learning. According to the Interaction Hypothesis (Long, 1996), interaction enhances acquisition while learners are engaged in negotiating meaning to solve a communication problem that has arisen.

Principle 4: Focus on Form needed

According to Schmidt (2001) focusing on form is necessary for vocabulary acquisition to take place which could be catered for in a number of ways. Also a focus on form emphasizes a form-meaning connection and teaches "vocabulary grammar" within contexts and through communicative-oriented tasks. These can be done through the following four main activities:

1. *Learner errors review.* Teacher addresses the noticed errors from each group to the whole class. The error could be written on the board to invite students to correct them. After the corrected version with a brief explanation is provided, students listen again and edit their own performance and any missed points could be commented by the teacher.
2. *Consciousness-raising tasks (CR tasks).* CR-tasks can be used as guided problem solving. Students are encouraged to notice particular features of the language, to draw the conclusions from what they notice and to organise their own view of language in the light of the conclusions they have drawn.
3. *Production practice activities.* An alternative or addition to CR-tasks is to provide more traditional practice of repetition, substitution, gapped sentences, jumbled sentences, transformation drills, and dialogues. Those activities may help students to automate forms that they have begun to use on their own accord but have not yet gained full control over.
4. *Noticing activities.* These activities focus on linguistic form. Fotos (1993) used dictation exercises that had been enriched with the target structures that students had tackled initially in CR tasks. Lynch (2001) recommends getting students to make transcripts of an extract (90-120 seconds) from their task performance as a method for inducing them to notice. Afterwards, the students could be asked to compare their own edited transcripts with the teacher's reformulated version. By so doing, students cooperated effectively in transcribing and engaged in both self- and other-correction.

Principle 5: Focus predominantly on meaning

A task-based approach provides a design of lessons around specific linguistic teaching points so both teacher and students view the academic English language as a tool for communicating rather than as an object to be analyzed and studied.

An important feature of TBL is that learners are free to choose whatever language forms they wish to convey what they mean by finding a way of getting round words or forms if they do not yet know or cannot remember. The teacher's role here is a monitor to encourage students' attempts to communicate in the target language. And by doing so, they experiment with language on their own and take risks. Fluency in communication is what counts. In later stages of the task framework accuracy does matter, but it is not important at the task stage. Learners need to regard their errors in a positive way, to treat them as a normal part of learning. Teachers should help them understand that it is better for them to risk getting something wrong, than not to say anything, otherwise, if they remain silent, they are less likely to learn. Because, language is the vehicle for attaining task goals, but the emphasis is on meaning and communication, not on producing language forms correctly (Willis, 1996, p. 24).

Principle 6: Developing Successful Output

According to Willis (1996) all tasks should have an outcome. Literature shows that it is the challenge of achieving the outcome that makes TBLT a motivating procedure in the classroom. An example of an activity that lacks an outcome should be shown by teachers to students in order to compare with the successful one which has a communicative purpose, not only the practice of language form. To achieve the outcome learners should focus first on meaning, and then on the best ways to express that meaning linguistically.

Principle 7: Recognize and Respect a zone of proximal development (ZPD) for professional learning

Following Vygotsky (1926; 1962), a zone of proximal development (ZPD) for professional learning (Baumfield et al., 2010) could provide support for the inquiry process that learning can be shared. Participating in a community of inquiry (CIP) enables the processes where the nature of teacher knowledge could be explored and understood.

Principle 8: Task Instruction needs to take account of a differential approach to learners

Students' level and learning styles could be different and teachers should select a variety of appropriate learning activities to make students more aware of their own approaches to learning and to develop awareness of alternative approaches. This could increase the range of learning strategies at the learners' disposal to make the learning effective and successful.

FINDINGS

The concept of defined 8 principles is considered in the three-stage TBLT model and in the textbook of English for Science and Technology as well. While adapting this textbook during the whole last academic year of 2016-2017 in S.Seifullin Kazakh Agrotechnical University, students were asked to reflect and ask questions or requests of how to use this textbook to meet students' needs and interests. Below, we provide the selected questions with our comments.

Is it necessary to do all the tasks and exercises?

It is recommended that students do the tasks and exercises in the order they appear within the units and also that you do *all* the tasks and exercises. Many words are recycled and consolidated throughout the tasks and exercises, that is, they appear a number of times in different tasks and exercises. This will benefit your practice in recognising and using the words.

Is it enough just to do the tasks and exercises?

At the end of each unit, there is an expansion/consolidation task which encourages you to form and support opinion about the topic you are studying in the unit. It also encourages you to discuss your opinions and reasoning with a partner agreeing or disagreeing with it. In addition, you should choose one of the statements covered in the unit and write a personal essay about it using new words and phrases you have learnt to provide support for your opinions and reasoning. There are also some exercises of recycling vocabulary, i.e. providing all the information you need to use it fully and correctly. It is also useful to organising your notebook and recording vocabulary to retain them while using the words when speaking and writing.

Can I use monolingual and bilingual dictionaries to do the tasks and exercises?

Dictionaries are the one resource students' worldwide use to improve their vocabulary and should use them systematically. Each unit provides practice for using dictionaries.

When I should use the answer keys?

You should check your answers when you finish each task or exercise. If you have made a mistake, notice the correct answer and try to understand what is wrong in your answer. If you still cannot understand why this is the correct answer, ask it with your teacher.

Is it necessary to do other vocabulary work?

The vocabulary work in this coursebook is organised in the way to recycle and consolidate them through various reading, discussion, and writing activities to expand students' word knowledge in new ways. To support you when considering other vocabulary work to apply, there are a range of other useful reference materials that link with the principles and practice behind the methodology framework, approach and strategy that are presented in the coursebook. E.g. the reference materials could be a glossary which provides you a list of words with their definitions, thesaurus and monolingual, namely English dictionary.

CONCLUSIONS

It is well-known that effective teaching is not about a method. It is about understanding and implementing principles of learning. The purpose of this paper was to provide the overview of professional English learning and teaching in Kazakhstan in the context of multilingualism and to reflect the influence of the defined methodological principles on professional English language acquisition. These principles have drawn on a variety of theoretical perspectives and practical home and foreign experience. The paper argues that these principles facilitate and succeed the process of professional English language learning and teaching. TBLT model and textbook of English for Science and Technology furthermore takes a pragmatic or task-based approach to learning taking account these defined principles. Its goal is to ensure the formation of real life-oriented language skills by involving students into contextualized, meaningful, and subject-oriented communicative tasks by helping students reorganize their existing knowledge to accommodate new knowledge, thereby raises the interest of students in professional English language learning. Finally, the authors leave the discussion open to redefine and adapt new innovative teaching practices, new principles as research findings evolve in the future.

Explorations

Extract (Lesson 5) from textbook on English for Science and Technology

5. WHAT IS SCIENCE? (READING)

Brainstorming

1. Read the heading. Answer the question in the heading.
2. What sort of information do you expect to find in the text? Tick one or more.
 - ☐ facts
 - ☐ ideas
 - ☐ opinions
 - ☐ advice
 - ☐ rules
 - ☐ jokes
 - ☐ instructions
3. What grammatical tenses do you expect to find in the text E? Why?

Making and checking hypothesis

5.1 (a) Read the first paragraph. What question will text E answer?

(b) What is your answer to the question?

(c) Read the rest of the text. According to the text,

- Which type of science is the most important? (? – Not sure what you mean)
- What do people often say about science? (?)
- Why it is referred as a system of acquiring knowledge?

WHAT IS SCIENCE?

Science is the study of how things work in the world. Also science refers to a system of **acquiring knowledge**. This system uses **observation** and **experimentation** to describe and explain **natural phenomena**. A **scientist** usually works in a **laboratory**. He or she works with many different kinds of **materials**, for example plastic or metal, and **liquids**.

What is the **purpose** of science? The most general answer to it is to **produce** useful models of reality. A scientist **tests** things to **prove** a hypothesis. A **hypothesis** is an idea that something is **true**. Scientists must **collect** all the facts first. Then he or she often puts the facts in a **table** with columns of information, or in a **graph**, with blocks or lines that **represent** the information.

Science as defined above is sometimes called **pure science** to differentiate it from **applied science**, which is the **application** of **research** to human **needs**. Fields of science are commonly **classified** along two **major** lines:

- **Natural** sciences, the **study** of the natural world, and
- **Social** sciences, the **systematic** study of human **behaviour** and **society**.

(adapted from T.Phillips & A.Phillips with N.Regan, 2011. Progressive Skills in English. Garnet Education)

Developing vocabulary skills

5.2 Read the text above, paying particular attention to the words in bold. Use your dictionary to check the meanings of the words in bold in the text below and then do the gap-fill exercise that follows.

laboratory	science	prove	experimentation	hypothesis	produce	knowledge
observation	science	acquire				

1. "The good thing about is that it's true whether or not you believe in it." - Neil Degrasse Tyson
2. We all in a similar way. We don't have different learning styles, right/left brain advantages, photographic memories; nor speed reading advantages, or brain development inappropriateness.
3. I'll record the facts from my personal point of view, and my
4. A more careful study of the physical as well as the chemical properties of a soil must precede intelligent in rotation.
5. After introductions, Dean was led to a in the rear of the building.
6. Food security is a real issue, and nations that do not at least some kinds of food are at risk.
7. You don't have a thing to to anyone except yourself.
8. If we accept the that each kind of atom has a specific and invariable weight, we can, with the aid of the above theory, make most important inferences concerning the proportions by weight in which substances combine to form compounds.

Fact – finding

5.3 (a) Think of your own answers to the five questions and discuss them with your partner. (5 min)

- What is science?
- What do scientists do?
- What is the purpose of science?
- What is a hypothesis?
- How does a scientist collect facts? (A little strange – Scientists don't collect facts. Maybe collect *data*?)
- How do you differentiate pure science from applied science?
- How do you classify different fields of science and what are they?

(b) Find four phrases in the text which refer to science, e.g. pure science, applied science. What similar phrases do you know? (2 min)

(c) How many phrases refer to scientific tasks or things, e.g. a scientist, observation, liquids?

REFERENCES

- Doughty, C. J., & Long, M. H. (eds.). (2003b). *Handbook of second language acquisition*. New York: Basil Blackwell.
http://kaznpu.kz/docs/ins_pedagogiki_psih/Verstka-Mangilik_El.pdf
- Baumfield, V., Hulme, M., Livingston, K. and Menter, L. (2010). Consultation and engagement? The reshaping of teacher professionalism through curriculum reform in 21st Century Scotland. (pp.57-73). *Scottish Educational Review*. 42(2).
- Послание Президента Республики Казахстан Лидера нации Нурсултана Назарбаева народу Казахстана (2012). «Стратегия «Казахстан-2050» - новый политический курс состоявшегося государства». <https://www.border.gov.au/Licensing/Documents/100-points-identification-guidelines.pdf>
- Бим, И.Л. (2002). Личностно-ориентированный подход-основная стратегия обновления школы// *Иностранные языки в школе*. - № 2.
- Зимняя И.А. (1999), *Педагогическая психология*. (с.74-89). Москва. – часть II, гл.1, §3.
- Кунабаева С.С. (2014). Компетентностное моделирование профессионального иноязычного образования. *Монография*. Алматы. (с.191).
- Алехин И.А., Казакова У.А., Кузнецова М.Н. (2017). Профессиональная ориентация как один из факторов формирования мотивации изучения иностранных языков преподавателями инженерных вузов// *Мир образования – Образование в мире*. (с.36-42). №1(65).
- Hornberger, N. H. (2009). Multilingual education policy and practice: Ten certainties (grounded in Indigenous experience). (197–211). *Language Teaching*, 42(2).
- Barnett. (2001). Los Limites de la Competencia. *El Conocimiento, la Eucacion Superior y la Sociedad*. Barcelona: Gedisa.
- Stenhouse, L. (1975). An Introduction to Curriculum Research and Development. London: Heinemann.
- Karl Kaliski and Derrin Kent. (2001). Implementing a TBL paradigm on pre-service teacher training courses. *IATEFL TT ED SIG newsletter* (pp. 12 – 15). no. 2.
- Willis, J. (1996). A framework for task-based learning. Harlow, U.K.: Longman Addison-Wesley.
- Krashen S. (1985). *The input hypothesis*. Harlow, Essex, UK: Longman.
- Ausubel, D. P. (1968). Educational Psychology: A Cognitive View. New York: Holt, Rinehart and Winston.
- Long, M. (1996). The role of the linguistic environment in second language acquisition. In W. Ritchie & T.Bhatia (Eds.), *Handbook of second language acquisition* (pp. 413-468). San Diego: Academic Press.
- Schmidt, R. (2001). Attention. In P. Robinson (Ed.), *Cognition and second language instruction*. Cambridge, England: Cambridge University Press.
- Fotos, S. (1993). Consciousness-raising and noticing through focus on form: *Grammar task performance vs. formal instruction*. (pp.385–407). *Applied Linguistics* 14.
- Lynch, T. (2001). Seeing what they meant: Transcribing as a route to noticing. (pp.124–32). *ELT Journal* 55.
- Новый Казахстан в новом мире. Послание президента Республики Казахстан народу Казахстана. г. Астана, 28 февраля 2007г. // Министерство юстиции РК – URL: <http://www.minjust.kz/ru/node/7507>
- Мейрамова С.А. (2012). New Strategies in EAP/ESP Teaching in Kazakhstan: Task-based Approach Application. Журнал «Issue of Professional and Academic English, the Journal of the IATEFL ESP SIG». Выпуск № 40. (с.19-24). Великобритания.
- Vygotsky, L.S. (1926; 1962). Thought and Language. Cambridge, MA: MIT Press (edited and translated by Eugenia Hanfmann and Gertrude Vakar).

The Influences of Musical Learning on Psycho-Physical Development, Intelligence and Technology

Giusi Antonia TOTO

University of Foggia, Foggia, Italy

giusy.toto@unifg.it

ABSTRACT

Music learning studies have shown the extraordinary evolutionary power in early childhood. Indeed, the learning of music has been shown to have an influence on the psycho-physical development according to psycho-dynamic perspective, on the development of intelligence, and finally on the design of new technologies. The first studies on musical learning based on a psycho-dynamic perspective date back to Freudian essays. The relationship between intelligence and music in contemporary studies has reached a high degree of parameterization with the investigation of all involved dimensions and recently studies on musical learning are producing specific research in the field of acoustic and audio technology. The purpose of this study is to highlight the relationship between these three dimensions and musical learning as well as to suggest new integrate perspectives to follow in the field of research projects.

INTRODUCTION

The state of the research suggests that the field of music learning has been related to many approaches and themes making complex the whole reading in a single picture. The purpose of this article is to analyze other aspects that have enriched the research beyond those strictly related to the scholastic field, i.e. issues concerned with cognition, learning, personality, intelligence and related skills. Parallel to these issues, psychological research has also been based on psychodynamic perspective that have been involved in the therapeutic and applicative practice of music. In this study it will trace the lines of contact between the basic constructs of dynamic psychology and contemporary knowledge of musical learning, pointing to these future research paths (Isenberg, 2015). Secondly, this study deals with the link between music and cognitive abilities relating to intellectual, social and cognitive development, focusing on studies seeking to trace the impact of the music on language development, literacy, numeration, creativity, engine coordination, memory, self-confidence, emotions, and social skills (Holochwost et al., 2017). Neurobiological research has shown that changes in the functionality of brain plasticity during an executive-performing task, thus demonstrating that the transfer of a cognitive ability is possible if it occurs in early childhood. The effects of using the Internet on new generations and the fundamental change in how to learn information also influence how to enjoy and learn music. In this direction, the third theme will deal with the relationship between musical learning and new technologies, as product and as a teaching process. The most discussed issue is whether new technologies also support the creation of music products, even making the student unaware of any musical music maker, without compromising the creativity and originality of the student (Bauer, 2014).

PSYCHOLOGY OF MUSIC FROM A PSYCHODINAMIC PERSPECTIVE

The link between music and psychology exists since the early experiments of the legendary Wundt laboratory in Leipzig, where music was used as a stimulus to measure perception and sensation. With the foundation of the Gestalt school, music was not simply a sum of parts, but its form assumed meaning as a structured totality from which it could be possible to translate sense and perception. Moving to behaviorism that still determined the stimulus function according to which it was possible to express emotional responses without being able to define a cause-effect relationship, music has known its utmost application in the 70's and 90's with cognitivism, thus becoming an object of theories on memory, learning and language (see for a review Monacis & Toto, 2017).

At the same time, music has been widely used in the therapeutic field through the creation of psychodynamic matrix constructs that have secured their bonds not only in theory but also in psychological practice, thus becoming a psychological research and application tool. Freudian concepts of unconscious, transfer and countertransference were the theoretical basis for the development of general constructions and techniques of music therapy. Various works in literature have shown that the use of music in psychotherapy practice facilitates the emerging of unconscious feelings in patients (Priestley, 1994) or as Gardstrom & Hiller (2010) observed, the selection and discussion of musical material can promote transfer and the countertransfer.

From the first uses of Freud in the practice of psychotherapy, psychotherapeutic methods have been greatly improved thanks to the fusion of dynamic psychology and music. In fact, music therapy techniques based on musical improvisation (Ahonen & Lee, 2011) or on free associations with songs (Austin, 2009), have been introduced to express the patient's unconscious.

Another important author who tried to unify theories and practices is Melanie Klein. To this purpose it should be important to recall her split theory (which also identifies a technique used in psychotherapy) elaborated in 1932, according to which the child can experience the mother's breast as both good and bad, and the internal object splits along with the ego. This splitting results from the ego's early lack of cohesion, and acts as a defense against primordial anxiety, achieving a dispersal of the destructive and persecutory anxieties, and offering a mechanism for the ego to be preserved. An important distinction needs to be made between the good and idealized object. An extremely deep split usually occurs between an idealized object and an extremely bad object.

This splitting has also been reflected in therapy, when the patient shows the bipolarity and conflicts between opposing sides and thus it becomes important the integration and the resolution between these opposing sides. Within this resolution process music can facilitate such inner integration: specifically, split parts assume the two different musical valences, and the patient can experience both of these roles through the specific music channel. This technique is particularly effective in subjects who are trapped in the parent-child dynamics, because music makes aware of experiencing the two different roles, or even in case of gender splitting, in which an individual can experience both sex roles in music and works for the integration of male and female aspects of life (Wheeler, 2015).

Winnicott with his model of object-relations represents another psychodynamic point of view to be mentioned. At a theoretical level, this author is the most cited in the scientific literature on music therapy. Its fundamental principle universally reported by therapists, who use music in their therapeutic practice, is that the psychotherapy is based on the overlapping of two playing areas, that of the patient and that of the therapist. If patient or therapist can not play, the practice can not be done and the therapist must accompany the patient to know how to play (Winnicott, 1971, p.54). In the game both the child and the adult become creative and use their creativity by discovering themselves. The child's playing has a state of attention that is close to that of the adult in deep concentration. In the game, as in music, impulses are freely expressed and in this regard Dvorkin (2013) describes music as a transactional object to use as a self-relaxing device. Winnicott (1958) emphasizes the importance of learning by oneself, but if music as a learning experience is experienced together with the patient, it does not contradict this principle, because it stimulates, evokes reactions, creates the possibility of escaping thought, thus maintain a complete individuality in front of a therapist.

Another important exponent of dynamic psychology is Bion who compares music with the preverbal state of speech development and with its resulting forms of communication. The role of the therapist in Bion's group therapy is crucial, as therapist guides patient in his experience, by projecting memory in the past or with desire, guides him in the future, but always bringing him back to the present of *hic et nunc*. The same experience of shifting and loss of temporality is presented in music, which evokes past and future experiences so that they must be brought to this present experience (Sutton, 2011). Kohut in a classical article entitled "Notes on the Psychological Functions of Music" (1958) emphasizes that psychological patterns of reflection and empathy are applicable to musical improvisation, they are applicable to musical improvisation, which allows the function of interior mirror of those who use it and the same musical expression induces an empathic reaction. These effects, however, says Kohut, may be induced by a wide selection of music that, unlike a poor selection, would have led to the failure of the two processes enunciated. The author finally shows in his article that music would have a medium function in dissipating conflicts, confirming what Klein had pointed out.

MUSICAL INTELLIGENCE AND RELATED SKILLS

Psychological theories and research have focused on the constructs and methods for improving mental health. Numerous studies are monitoring the empirical evidence of the effects of music on the intellectual, social and cognitive development of children and young people during the musical experience and training (Heinonen-Guzejev, Kliuchko, Monacis, Spinosa, Heikkilä, Tervaniemi, Brattico, , 2015; Kliuchko, Heinonen-Guzejev, Monacis, Gold, Heikkilä, Spinosa, Tervaniemi, Brattico, 2015).

In addition, it has been experimentally demonstrated that musical abilities can be transferred to other activities as the transfer of skills and learning occurs when what is learned in a given area is moved and generalized in several areas that usually affect cognitive abilities (Mestre, 2005). Personality and identity studies have also made an important contribution because it has been shown that personality can be a mediating factor in transferring skills to the learning and identity construction processes (Monacis, L., de Palo, V., Sinatra, M., Berzonsky, 2016). Not by chance, researchers define the personality of musician as independent, individualistic, but also bold, sensitive to the path of knowledge of the depth of things beyond the material aspect, and anxious to seek perfectionism (Mihajlovski, 2016). Individual differences have also been identified among musicians of various instruments, such as brass players show a more extroversion trait and have low levels of self-discipline (Wills & Cooper, 1988). Moreover, gender differences or music choices also influence personality (Mas-Herrero et al., 2013). Contemporary studies explore the impact of musical abilities in language development, literacy, numeracy, intelligence measures, creativity, coordination of engine end, concentration, memory, self-confidence, emotions and in social skills (Toto, 2017).

Early exposure to music in childhood correlates with higher IQ scores and academic success (Schellenberg, 2006). Musical training requires targeted attention, an understanding of complex models of interpretation, memory and motor skills. A study by Moreno et al. (2011) reports the effects of two interactive computer training programs developed for preschool children: one for music and one for visual arts. After twenty days of training, only the boys belong to a music band have shown better verbal performance. These improvements in verbal intelligence have been positively correlated with changes in the functionality of brain plasticity during an executive-function task, demonstrating that the transfer of a cognitive ability is possible in early childhood. Brain research has shown that exposure to stimuli (visual, sonic, tactile) during childhood is crucial to the formation of multiple neural connections, thus promoting the development of multiple abilities including motions, emotions, behavioral, cognitive, and social issues (Hallam, 2010). Exposure to musical listening (the same applies to adult's speech discourse) rapidly improves the ability to distinguish sounds, reinforcing auditory discrimination and improving cortical processing of language models (Bigand & Poulin-Carronnat, 2006). Subsequent studies have confirmed that about 50% of the brain is well structured between 7-11 years and between 9 and 13 years and that the brain undergoes a process of eliminating of unnecessary associations while maintaining the more useful networks, and that a certain scarcity of neuronal connections in children in a state of cultural deprivation and whose brain appears 20-30% smaller than peers (Thompson & Nelson, 2001; Harris, 2009).

A series of experiments that expose children with reading or dyslexia problems due to cultural deprivation to a weekly rhythmic training, including beat, beat and simple notation, have significant effects on phonological awareness, literacy and reading skills (Thomson, 2014, Long, 2014). It has been studied that music education improves auditory and verbal memory (Rodén et al., 2014) and Miendlarewska and Trost (2014) have suggested an essential mechanism that supports the learning and development of executive functions that may be at the base of improvements in reading and verbal memory. Other research has shown that music education has specific effects on reasoning and spatial skills in children (Persellin, 2000). From the early studies of the 1930s to the 40s, it was hypothesized the relationship between musical formation and intellectual development. Recent studies have shown that children with high IQ and belonging to a socio-cultural context rich in these conditions will also lead to the study of a musical instrument or musical activity (Schellenberg & Mankarious, 2012, Costa-Giomi, 2012).

During a musical performance, emotions pass under the form of nonverbal communication, through which people can respond in a basically subjective way, feeling different emotions. Resnicow et al. (2004) have shown, however, that there is a correlation between the characteristics of emotional intelligence and the identification of emotion in musical performance since they are based on the same sensitivity. Studies on the effects of music on creativity are still scarce, although those who benefited from music education have shown a significant increase in creativity and motor skills (Eerola & Vuoskoski, 2013). According to Gibson et al. (2009) the most interesting aspect of critical thinking and creativity emerges from the hypothesis of the transferability of these abilities through the artistic activity in general (Monacis, de Palo, Di Nuovo & Sinatra, 2016) and the rise of the diverging thinking of musicians towards non-musicians.

MUSIC LEARNING and TECHNOLOGY

Albert Bregman in his 1990 book *The Auditory Scene Analysis: the perceptual sound organization*, has formulated the construction of the auditory scene analysis (ASA), focusing on ways to rework the brain of that system. His theories on ASA have provided new perspectives for researching human and animal hearing systems, behavioral and neurological language perception studies, musical theory, hearing aid design, audio technology, and finally for the separation of speech from other sounds of computer. From this point of view it is important to understand how psychological theory has influenced the design of technology and at the same time how new technologies have changed ways of thinking, acting or perceiving the surrounding reality.

A sector strongly linked to technology that also influences the subsequent design is education: training must interact with the subjects in training to whom knowledge is transferred, taking into account the socio-cultural context of belonging. The pervasiveness of technology in everyday life makes it an indispensable medium for communication and mediation. In addition, the educational potential and teaching variation are infinite so that content and relationships can be exponentially differentiated. de Palo, Sinatra, Tanucci, Monacis, Di Bitonto, Roselli, Rossano, 2012; Di Bitonto, Roselli, Rossano, Monacis, Sinatra, 2010; Monacis, Finamore, Sinatra, Di Bitonto, Roselli, Rossano, 2009). In this regard, a Chinese research (Ho, 2004) has evaluated to what extent the programmed introduction of Information Technology (IT) for five years in music lessons has led to the change in the changing learning mode of learning. Three generalizable questions emerge in all learning systems that experience IT: (1) is IT use to teach the most effective music in traditional music pedagogy? (2) According to teachers' opinions, could IT help improve teaching practices? And (3) Does IT use increase students' interest in learning music? Although teachers in this study have argued that music technology could facilitate their work, they had different opinions about using IT and the quality of music education. Students, on the other hand, appreciate the fact that using IT will improve the quality of their learning.

The didactic practice for building multimedia classes involves, in addition to using computers, the use of CDs. Projectors, DVD players and LD / VCDs, MIDI keyboards, synthesizers, amplifiers and music software. In music, there are programs that have been developed to allow students without music background to create music. However, there are many hesitations to incorporate technology into the classroom. Many of these hesitations can be attributed to the lack of knowledge of available programs. Students who have not been able to follow music lessons through music technology can learn and appreciate music even from teenagers (Gall, 2017). Skills are no longer needed to compose or perform musical performances, but MIDI technology for creating electronic music also allows those who do not have the traditional music to do/play music. Technology also allows students to express their "music" ideas more easily, allowing them to participate while being culturally disadvantaged. Digital consumption and production have also changed the way in which music is used, this diffusion has exceeded traditional production and distribution (Peters, 2017).

However, technology has not always been blindly followed by students, since it has been demonstrated that when students of music education are questioned about their preferences between teacher or computer feedback, they had answered to prefer a human feedback to that provided by a computerized program, thus demonstrating the relational and emotional value of education not yet achieved by technological tools (Karlsson et al 2009).

Starting from the assumption that technology has an effect on enthusiasm and interest for students and that by now the means of communication and information retrieval, an interesting study has tried to combine music, technology and the scientific study. This study aimed to determine the effect of music – as a didactic means- on scientific declination towards the understanding of scientific processing skills and students' attitudes towards science, by using the "scientific song" containing facts, concepts, laws and theories of science with music. The results of this study show that the development of the *scientific* songs has let participants to experience a process for the practice of science, including concepts and scientific facts, and to a positively improvements of attitudes towards science. The success of this study on an adult audience demonstrates the adding value of music in learning if adequately supported by appropriate technologies and interdisciplinary nature. Teaching is, therefore, crucial to student progress, but this does not exclude the idea that technology is still an important support to creativity and success in learning music. (Yoon & Kim, 2017)

Music creativity is another well-studied theme in the use of technology in learning; it passes through different stages (Burnard 2012). Music creativity, in fact, must have group study moments and individual study moments. At the basis of musical creativity, there is the inspiration that needs of both internal moments of creation and moments of external expression, technology can play a decisive role. From a pedagogical point of view this leads to a dual problem in teaching practice (Leman & Nijs, 2017): (1) how to conform the learning and content of music technology to class instruction (2) how to measure and evaluate learning products that are definitely richer in expressiveness, but which hide the student's level of knowledge. In addition to these issues of music, the theme of music education has also dealt with research focused on the role of music education in the recovery of marginalized pupils and students (Creech et al., 2013, Rusinek, 2008). While maintaining a restless behavior and systematically refusing school rules, studies show that pupils appreciate music lessons. In this particular condition, the teacher has generated enthusiasm through an inclusive approach, where no learning difference arises, and the music is an instrument to stimulate everyone. Burnard (2007) emphasizes that music activities are fun and offer students the opportunity to value positive values such as cohesion and self-esteem as well as an improvement in social behaviors and skills. In this sense, it could be assumed the educational value of music as hand in hand of other school matters such as physical education and sports (Monacis, de Palo & Sinatra 20014).

CONCLUSIONS

The three above-mentioned dimensions have intended to demonstrate how the research approach to music learning must take into account a variety of themes, methodologies and tools. The purpose of this study is not to examine all dimensions involved in the music learning process, but to show these three significant and effective ones and to submit unpublished research questions. The analysis of the classical constructs of dynamic psychology used in musical learning has shown that music is used both in the field of didactic and therapeutic and recreational, but the hypothesis of this study is that music has effects through the same mechanisms or has the same functions in different areas. Concerning the analysis of the implications of psycho-dynamic perspective on music learning, it has emerged that music therapy uses classical therapeutic instruments by declinating them with music. Freudian concepts of the unconscious and the transference and countertransference are the theoretical basis for the development of general constructions and the techniques of musical therapy, since the use of music in psychotherapeutic practice allows the emerging of unconscious feelings in patients. The splitting technique, for example, based on Klein's theories is an effective method in treating the disorders. The link between music and psychotherapy on the side of memory and learning has been traced through Bion and Winnicott.

In addition, from experimental point of view, by establishing the linkages between musical education and cognitive functions, further studies have sought to understand whether this association is directed or mediated by another mechanism that influences musical learning and in turn intelligence. The studies focused on the systematic research of executive function, namely the ability to consciously control thought, can inhibit inappropriate responses, future planning, concentration, selective focus, and the ability to change strategies according to situations (Schellenberg, 2011). In this research, the field of inquiry has widened, assuming that other components also influence the executive mechanism of music.

The second dimension addresses to the analyses of the correlations observed between musical formation, intelligence and memory and other cognitive abilities. Examined studies have shown that music education improves general intelligence that is linked to many cognitive and academic skills, thus confirming the hypothesis that music education can improve overall cognitive abilities in children and adolescents and may have effects secondary to all other skills and competences. Early music treatment in children is correlated positively to work memory, cognitive control, or cognitive flexibility.

Finally, the development of new technologies has created a new socio-cultural context in which students are immersed, and of new languages and media with which education sciences have to talk. Although the data are being studied by the studies reported, they improve the teaching practices and the use of information technology increases the interest of students. Interdisciplinary studies have demonstrated the adding value of music in learning if adequately supported by appropriate technologies. Ambivalent is the study of musical creativity as a student without any musical knowledge can become a music creator and this process is difficult to evaluate from a scholastic point of view. Thus, the didactic planning must question the effectiveness of the effects of technology on musical contents (Cain, 2004).

REFERENCES

- Ahonen, H., & Lee, C.A. (2011). The meta-musical experiences of a professional string quartet in music-centered psychotherapy. In A.N. Meadows (Ed.), *Developments in music therapy practice: Case study perspectives* (pp.518-541). Gilsum, NH: Barcelona Publishers.
- Austin, D. (2009). *The theory and practice of vocal psychotherapy: Songs of the self*. London: Jessica Kingsley Publishers.
- Bauer, W.I. (2014). *Music learning today: Digital pedagogy for creating, performing, and responding to music*. Oxford: Oxford University Press.
- Bigand, E. & Poulin-Carronnat, B. (2006). Are we 'experienced listeners? A review of the musical capacities that do not depend on formal musical training, *Cognition*, 100, 100-130.
- Bregman, A.S. (1990). *Auditory Scene Analysis: The Perceptual Organization of Sound*. Cambridge: Mit press.
- Burnard, P. (2007). Reframing creativity and technology: Promoting pedagogic change in music education. *Journal of Music, Technology & Education*, 1(1), 37-55.
- Burnard, P. (2012). *Musical creativities in practice*. Oxford: Oxford University Press.
- Cain, T. (2004). Theory, technology, and the music curriculum. *British Journal of Music Education*, 21(2), 215-221.
- Costa-Giomi, E. (2012). Music instruction and children's intellectual development: the educational context of music participation. In R. MacDonald, G. Kreutz, & L. Mitchell (Eds), *Music, health and well-being* (pp.337-355). Oxford: Oxford University Press.
- Creech, A., Gonzalez-Moreno, P., Lorenzino, L., & Waitman, G. (2013). *El Sistema and Sistema-inspired programmes: A literature review of research, evaluation and critical debates*. San Diego, California: Sistema Global.
- de Palo, V., Sinatra, M., Tanucci, G., Monacis, L., Di Bitonto, P., Roselli, T., & Rossano, V. (2012). How cognitive styles affect the e-learning process. *Proceedings of the 12th IEEE International Conference on Advanced Learning Technologies, ICAALT 2012*, 359-363.
- Di Bitonto, P.D., Roselli, T., Rossano, V., Monacis, L., & Sinatra, M. (2010). MoMA: A mobile museum adaptive tour 6th IEEE International Conference on Wireless, Mobile and Ubiquitous Technologies in Education. *WMUTE 2010: Mobile Social Media for Learning and Education in Formal and Informal Settings*, 156-160.
- Dvorkin, J. (2013). Adults and adolescents with borderline personality disorder. In L. Eyre (Ed.), *Guidelines for music therapy practice in mental health* (pp.511-541). University Park IL: Barcelona Publishers.
- Eerola, T., & Vuoskoski, J.K. (2013). A review of music and emotion studies: approaches, emotion models, and stimuli. *Music Perception: An Interdisciplinary Journal*, 30(3), 307-340.
- Gall, M. (2017). Technology in Music Education in England and across Europe. In A. Ruthmann & R. Mantie (eds.), *The Oxford Handbook of Technology and Music Education* (pp.31-48). Oxford: Oxford University Press.
- Gardstrom, S.C., & Hiller, J. (2010). Song discussion as music psychotherapy. *Music Therapy*

- Perspectives, 28(2), 147-156.
- Gibson, C., Folley, B.S., & Park, S. (2009). Enhanced divergent thinking and creativity in musicians: a behavioural and nearinfrared spectroscopy study. *Brain and Cognition*, 69(1), 162-169.
- Hallam, S. (2010). The power of music: Its impact on the intellectual, social and personal development of children and young people. *International Journal of Music Education*, 28(3), 269-289.
- Harris, M. (2009). *Music and young Mind: enhancing brain development and engaging learning*. UK: Rowman and Littlefield Publishing group.
- Heinonen-Guzejev, M., Kliuchko, M., Monacis, L., Spinosa, V., Heikkilä, K., Tervaniemi, M., & Brattico, E. (2015). The association of noise sensitivity with musical aptitude and everyday use of music INTER-NOISE 2015 - 44th International Congress and Exposition on Noise Control Engineering.
- Ho, W.C. (2004). Use of information technology and music learning in the search for quality education. *British Journal of Educational Technology*, 35(1), 57-67.
- Holochwost, S.J., Propper, C.B., Wolf, D.P., Willoughby, M.T., Fisher, K.R., Kolacz, J., ... & Jaffee, S.R. (2017). Music education, academic achievement, and executive functions. *Psychology of Aesthetics, Creativity, and the Arts*, 11(2), 147-166.
- Isenberg, C. (2015). Psychodynamic approaches. In B.L. Wheeler (ed.), *Music therapy handbook* (pp.133-147). New York: Guilford Press.
- Karlsson, J., Liljeström, S., & Juslin, P.N. (2009). Teaching musical expression: effects of production and delivery of feedback by teacher vs. computer on rated feedback quality. *Music education research*, 11(2), 175-191.
- Klein, M. (1997). *The psycho-analysis of children*. New York NY: Random House. (Original work published 1932).
- Kliuchko, M., Heinonen-Guzejev, M., Monacis, L., Gold, B.P., Heikkilä, K.V., Spinosa, V., Tervaniemi, M., & Brattico, E. (2015). The association of noise sensitivity with music listening, training, and aptitude. *Noise and Health*, 17(78), 350-357.
- Kohut, H. (1957). Observations on the psychological functions of music. *Journal of the American psychoanalytic association*, 5(3), 389-407.
- Leman, M., & Nijs, L. (2017). Cognition and technology for instrumental music learning. In A. King, E. Himonides & A. Ruthmann (eds.), *The Routledge Companion to Music, Technology, and Education* (pp.23-35). London: Routledge.
- Long, M. (2014). 'I can read further and there's more meaning while I read': An exploratory study investigating the impact of a rhythm-based music intervention on children's reading. *Research Studies in Music Education*, 36(1), 107-124.
- Mas-Herrero, E., Marco-Pallares, J., Lorenzo-Seva, U., Zatorre, R.J., & Rodriguez-Fornells, A. (2013). Individual differences in music reward experiences. *Music Perception: An Interdisciplinary Journal*, 31(2), 118-138.
- Mayer, J.D. (2002). *Mayer-Salovey-Caruso emotional intelligence test (MSCEIT), version 2.0*. Toronto, Canada: Multi-Health Systems.
- Mestre, J.P. (2005). *Transfer of learning from a modern multidisciplinary perspective*. Greenwich, CT: Information Age.
- Miendlarzewska, E.A. & Trost, W.J. (2014). How musical training affects cognitive development: rhythm, reward and other modular variables. *Frontiers of Neuroscience*, 20(7), 279.
- Mihajlovski, Z. (2016). Musician as a Distinctive Personality Structure—Yes or No?. *Croatian Journal of Education*, 18(Sp. Ed. 2), 125-143.
- Monacis, L., & Toto, G.A. (2017). *La Musica nelle principali scuole di psicologia*. Lecce: youcanprint.
- Monacis, L., de Palo, V., Di Nuovo, S., & Sinatra, M. (2016). Validation of the rational and experiential multimodal inventory in the Italian context. *Psychological Reports*, 119(1), 242-262.
- Monacis, L., De Palo, V., & Sinatra, M. (2014). Sportpersonship behaviours: An exploratory investigation of antecedents. *International Journal of Sport Psychology*, 45(3), 231-245.
- Monacis, L., de Palo, V., Sinatra, M., & Berzonsky, M.D. (2016). The revised identity style inventory: Factor structure and validity in Italian speaking students. *Frontiers in Psychology*, 7(JUN), art. no. 883.
- Monacis, L., Finamore, R., Sinatra, M., Di Bitonto, P., Roselli, T., & Rossano, V. (2009). Adaptive learning using SCORM compliant resources *Proceedings: DMS 2009 - 15th International Conference on Distributed Multimedia Systems*, 222-227.
- Moreno, S., Bialystok, E., Barac, R., Schellenberg, E.G., Cepeda, N.J., & Chau, T. (2011). Short-term music training enhances verbal intelligence and executive function. *Psychological science*, 22(11), 1425-1433.
- Persellin, D.C. (2000). The effect of activity-based music instruction on spatial-temporal task performance young children. *Early Childhood Connections*, 6, 21-29.
- Peters, V. (2017). The Impact of Technologies on Society, Schools, and Music Learning. In A. Ruthmann & R. Mantie (eds.), *The Oxford Handbook of Technology and Music Education* (pp.277-290). Oxford: Oxford

University Press.

- Priestley, M. (1994). *Essays on analytical music therapy*. Gilsum NH: Barcelona Publishers.
- Resnicow, J.E., Salovey, P., & Repp, B.H. (2004). Is recognition of emotion in music performance an aspect of emotional intelligence?. *Music Perception: An Interdisciplinary Journal*, 22(1), 145-158.
- Roden, I., Grube, D., Bongard, S., & Kreutz, G. (2014). Does music training enhance working memory performance? Findings from a quasi-experimental longitudinal study. *Psychology of Music*, 42, 284-298.
- Rusinek, G. (2008). Disaffected learners and school musical culture: an opportunity for inclusion. *Research studies in music education*, 30(9), 9-23.
- Schellenberg, E.G. (2006). Long-term positive associations between music lessons and IQ. *Journal of Educational Psychology*, 98, 457-468.
- Schellenberg, E.G. (2011). Examining the association between music lessons and intelligence. *British Journal of Psychology*, 102, 283- 302.
- Schellenberg, E.G., & Mankarious, M. (2012). Music training and emotion comprehension in childhood. *Emotion*, 12, 887-891.
- Sutton, J. (2011). A flash of the obvious: Music therapy and trauma. In A.N. Meadows (Ed.), *Developments in music therapy practice: Case study perspectives* (pp.368-384). Gilsum LH: Barcelona Publishers.
- Thompson, R.A., & Nelson, C.A. (2001). Developmental science and media: Early brain development. *American Psychologist*, 56(1), 5-15.
- Thomson, J. (2014). Rhythm and literacy abilities: what is the relationship and can rhythm-based interventions help students with dyslexia. Paper presented at the conference The Neurosciences and Music – V: Cognitive stimulation and rehabilitation, 29th May to June 1st, Grand Theatre/Palais des Ducs, Dijon.
- Toto, G.A. (2017). The Role of The musical Learning in the Development of the socio and cognitive abilities. A review. *Turkish Online Journal Of Educational Technology. Special Issue INTE 2017*, 2017.
- Wheeler, B.L. (2015). *Music therapy handbook*. New York-London: Guilford Publications.
- Wills, G. & Cooper, C.L. (1988). *Pressure Sensitive: Popular Musicians Under Stress*. London: Sage.
- Winnicott, D.W. (1958). The capacity to be alone. *The International journal of psycho-analysis*, 39, 416-420.
- Winnicott, D.W. (1971). *Playing and reality*. London: Psychology Press.
- Yoon, J., & Kim, K.J. (2017). Science Song Project: Integration of Science, Technology and Music to Learn Science and Process Skills. *K-12 STEM Education*, 3(3), 235-250.

The Representation of the Victim as a Social Construction in Court News

Çağdaş ÖĞÜÇ

*Near East University, Graduate School of Social Sciences,
Student of Media and Communication Studies PHD Program,
Nicosia TRNC. cagdas.oguc@neu.edu.tr*

Ayhan DOLUNAY

*Near East University, Legal Advisor and Lecturer of
Faculty of Communication, Nicosia, TRNC.
ayhan.dolunay@neu.edu.tr*

Fevzi KASAP

*Near East University, Head of Faculty of Communication
Radio TV and Cinema Department,
Nicosia, TRNC. fevzi.kasap@neu.edu.tr*

ABSTRACT

There has been an increase in rape and abuse cases in the northern part of Cyprus. Consequently, these cases have begun to be reported by sections of the media in the Turkish Republic of Northern Cyprus. Unlike the traditional media, the characteristics of Internet journalism mean that it can be continually updated and it has the potential to reach the target audience, which has not only increased a common sensitivity, but also unethical acts in journalism.

This research examines how Internet media reported on two cases that occurred in the Turkish Republic of Northern Cyprus. These cases are the rape and murder of 7-year-old Mustafa Diker by his father in 2012. This case created a sense of indignation throughout Cyprus. The other case is that of 15 year old İ.E who raped a 5-year-old female child.

Furthermore, based on the fact that the concept of victim is shaped by personal and social values, it will be assessed how this concept is actually used by power holders in creating social construction as a means of social control. From this point of view, the perception created by the society based on the nationalities of the suspects will be taken into consideration.

Keywords: *Rape, abuse, TRNC, Law of Information, Internet Media, Traditional Media*

OBJECTIVE-SCOPE-METHOD

The Internet media has become an irreplaceable information source for all, as it has facilitated access to information at the touch of a button. It has become very easy to reach as it is completely free, fast and provides access to up-to-date news within seconds. The media in the Turkish Republic of Northern Cyprus (TRNC) media has shown an interest in news about incidents of rape, which have recently increased in the country. The objective of this study is to research the presentation of news about rape in the Internet media. Considering that the Information Law has still not been implemented, this work will aim to examine the Internet-based newspapers and their presentations of news about rape by providing specific samples.

With the descriptive approach to news about rape in the TRNC, all the articles concerning the two cases have been identified and have been analyzed based on other researchers' works. This work is particularly important for understanding the ethics that journalists should keep in mind while writing stories about rape, considering both the victim and perpetrator. In this case, this study aims to contribute to understanding the facts of news, the topic of news and the subject of news in the media.

In the final research conducted by the Media Ethics Committee in 2013, it was determined that there are 48 Internet newspapers in the TRNC. Undoubtedly, this number will have increased in the past 4 years. As the Information Law has not been implemented in the TRNC, standards have not been established to regulate Internet media. Hence, it should be considered that people who have no education in the media and who are not concerned about journalistic ethics can publish through the Internet media and can write stories in the country.

Although the Media Ethics Committee's statements have been used in this study, it should be understood that the Media Ethics Committee has no sanctioning powers in the country. Hence, Media Ethics Committee's statements should be taken to demonstrate how ethics in journalism should function. While examining the cases, in the second rape case, the name of the defendant has not been used as the defendant was under the age of 18.

Journalists cannot be dissociated from the society. Therefore, changes that the societies have been experiencing also apply to journalists. Sometimes, journalists can overreact to issues that occur in the country and this leads to a breakdown in common sense. Consequently, journalists often disregard the fact that there are often two sides to a story, which is one of fundamental ethics of the journalistic code. It is easy to provoke a reaction with stories of rape, suicide or murder. Therefore, it should be considered that journalists can often impose their own emotions into their news articles. Although they prepare articles under the pretense of journalistic impartiality, they usually assign blame to suspects who have not even had a trial.

In this study, the Internet newspapers who published in the TRNC have been examined. Some of the newspapers only publish through Internet media, while some also print traditional newspapers. In this research, it is found that newspapers who publish traditional newspapers seem to demonstrate more concern for ethical bases, while those who only publish on the Internet show less concern and are more interested in increasing their readership.

CRIME AND MEDIA

News about sexual rape is one of the most compelling stories found in the TRNC society. It is important that the society pays attention to these kinds of stories. Stories about rape represent the easiest and fastest way to attract readers to websites in the TRNC. Some of the Internet newspapers care about ethical rules, while others who are only interested in earning revenue from journalism do not care about ethical rules, or even laws. The only concern is how they can increase the number of followers of their page. The Internet-based newspapers who are not concerned with ethical rules, use titles that do not reflect the reality and are only aimed at attracting readers. It is known that advertising is the basic source of income for the Internet newspapers. Thus, the transmission of an advertisement to as many readers as possible and attracting new advertisements can only be achieved through more 'clicks'. Therefore, it is easy to observe that newspapers use exaggerated, incorrect and sensational titles to achieve that goal.

To find a solution to this problem, the Media Ethics Committee signed a declaration with the directors of Internet media in 2014, which stated "It is not appropriate to use exaggerated, incorrect and sensational titles just to create more clicks" (Internet Media Declaration; 2014). Unfortunately, most of the websites do not follow the signed Declaration today.

Social media allows users to access the content they want, create new content, and share information they receive outside of the traditional media. It allows the users to access the news either instantly or whenever they want, directly with the users on their own list, or by adding and sharing comments facilitating the access to news at the same time (Weeks & Holbert, 2013).

Rape causes more permanent and psychological damage to a victim than physical injury (Criminal Law/Art. 144). The laws in the TRNC (Criminal Law/Art. 145) suggest that a this crime is a grave criminal offense and life imprisonment should be considered as the punishment. On the other hand, the Constitution of the TRNC (Art. 18) also says that anyone charged with a crime is considered to be innocent until proven guilty.

The Media Ethics Committee made a statement in 2014 regarding rape, which stated, " The press should be respectful to presumption of innocence and should avoid publishing any article claiming a person is guilty unless the offense is fixed by judgment. Claims and advocacy must be transferred fairly and equitably in ongoing proceedings". With this statement, the Media Ethics Committee have referenced universal journalistic principles. (Internet Media Declaration; 2014)

In the same statement, the Media Ethics Committee attributed the media's power of mass access and said that if this principle is not taken into consideration, it could be detrimental to people's lives, and that an innocent man could suffer the loss of his reputation, career or even his life.

"Today, aggression/violence or crimes are being analyzed in terms of biology, psychology, psychiatry and sociology. The separate resolution of violence or aggression by each of these disciplines demonstrates that violent behavior has a multidimensional and complex character (Kızmaz, 2006: 248)

Kosse explains why it is important how the rape victim or the perpetrator is presented by the media: "The rape storytelling in the media affects people's thoughts and reactions to rape, and causes misinformation and stereotypes about rape to persist. This effect is quite damaging because it prevents the community from seeing the real causes and issues underlying the rape. Rape can lead to improper understanding, wrong policies and legislation. Eventually, if the media continue to use unreal stories, real victims become less likely to share their true stories" (Kosse, 2007: 3).

MEDIA TO CREATE A SOCIAL PERCEPTION

This research aims to address the ethical violations and the method of processing rape in the media by presenting two cases that caused significant consternation in the Northern Cypriot community. Within the scope of this research, a case from 2012 in which a 7-year-old boy was raped and murdered by his father and the case of a 15-year-old boy who raped a 5-year-old girl in Nicosia are compared.

When people think about rape in society, the Mustafa Diker incident has considerable prominence. Seven year old Mustafa Diker was raped repeatedly, murdered and buried by his father in 2012. The issue entered the public arena when Mustafa Diker was declared missing on the 9th of April 2012. The boy's body was found on 14th of April 2012 in a garbage disposal area of Taşkent and Mustafa Diker's father Erol Diker, his uncle İbrahim Diker and his stepmother Özlem Diker were all arrested. On 6th of August 2013, the Criminal Court of Nicosia sentenced the father Erol Diker and imprisoned him for life. The court found Erol Diker guilty on 12 out of 13 charges of which he was accused. Bahar Saner, the Chairman of the Criminal Court Delegation, made a statement in the court about the issue and drew attention to the fact that rape was the most serious crime after the murder, which required a punishment of 14 years.

Another case of rape occurred on June 24, 2016, where 15-year-old İ.E, deceived a 5-year-old girl by asking her to play hide and seek and subsequently raped her. The court, found İ.E. guilty on the 23rd of October 2016 and imprisoned him for 14 years. İ.E. was found guilty on all 11 charges, including "sexual assault by violence", "kidnapping and detention of a child of the age of 5 without permission", "severe harm", "sexual assault", "sexual abuse", and "assault"

It is necessary to focus on how the media processes news about rape. After the incidents of rape, the media framed the story in a particular manner from the outset, in the form of "infuriating the society," "reducing the society's despair," and "experiencing a shocking event." The language, which can be expressed as the style of the media organizations, while giving some features to the news, can also cause some restrictions. "In the process of news writing, short and clear sentences should be preferred, which can lead to frequent mistakes as a result of the race to publish to beat the competitors." (Yurdigül & Zinderen, 2012: 82)



Öz oğlu 7 yaşındaki Mustafa Diker'i döverek öldürdükten sonra çöplüğe atan Erol Diker'in, Lefkoşa Ağır Ceza Mahkemesi'nde dün görüştülen duruşmasında üç tanık dinlendi. Erol Diker ile aynı apartmanda kalan komşusu Döne Çapan, Mustafa Diker'in öğrenim gördüğü Haspolat İlkokulu Müdürü Uğur Çınar ve Haspolat sakini Mehmet Gürpınar olayla ilgili izlenimlerini mahkemeye anlattı.

Çınar: Bizden yardım istedi

Sanık Erol Diker ile ilgili Lefkoşa Ağır Ceza Mahkemesi'nde görüştülen dünkü duruşmada tanık kürsüsüne ilk olarak, 7 yaşındaki Mustafa Diker'in öğrenim gördüğü Haspolat İlkokulu Müdürü Uğur Çınar çıktı.

Uğur Çınar, mahkemeye verdiği ifadede, bir dönem öğrencisi olan Mustafa Diker'i bir defasında, okul binasının koridorunda yürürken gördüğü sırada yüzünün kızanık olduğunu fark ettiğini söyledi.

Tanık Uğur Çınar, sanık Erol Diker'in Mustafa Diker kaybolduktan sonra, pazartesi günü okula gittiğini ve kendisine "Çocuğumu çok geç buldum, onu çok seviyorum. Geldiği günden beri her hafta sonu mangal yakıyorum. Şimdi de kaybettim. Ne olur oğlumun bulunması için bana yardım edin" dediğini söyledi.

From the Havadis Newspaper, Duygu Alan's statement on 15 May 2013 with the headline "He denies he is his son" contained the following statement. "Erol Diker, who beat his 7-year-old son Mustafa Diker to death and threw him in the garbage ..." As can be seen from the introduction, the news story about an individual who has not tried by the court has been presented as a "murderous father" and the story was shaped around this theme.

In the story, it can be witnessed that the reporter, who made an emotional connection with the incident, is punishing the individual accused of the crime before they have been found guilty. According to the news, the father, Erol Diker, has been convicted by the journalist without his guilt being proven in court. This important mistake creates serious problems.

Linç korkusu yüzünden Erol Diker'e cezaevinde özel bölüm hazırlanıyor

7 yaşındaki Mustafa'ya tecavüz ederek vahşice öldüren utanmaz baba Erol Diker için cezaevinde özel bölüm hazırlanıyor

From Kıbrıs Gazetesi's story written by Elmas Tokay on May 4 2012, it can be seen that Erol Diker stated that he had a fear of being "lynched" in the prison and a private cell was prepared for him. The following statement is included in the opening section of the news article: "A special room in the prison is being prepared for Erol Diker, the shameless father who brutally killed Mustafa at the age of 7". As can be seen, the journalist showed disdain towards Erol Diker was still in the judicial process and called him a "shameless father", which played a significant role in the perception of society. Moreover, it is known that on 6 August 2013, the day on which final judgement was given, the father Erol Diker came to the court with a with a backdrop of a furious crowd demanding to lynch him.

Yenidüzen Newspaper, in its August 6 issue, conveyed information about the lynching attempt as follows: "The angry crowd who wanted to lynch Erol Diker, kicked the police vehicle and protested by applauding the police trying to secure Erol Diker, who murdered 'little Mustafa'"



"Mustafa Diker cinayet davası"nda KARAR

Bir yılı aşkındır süren 7 yaşında öldürülen Mustafa Diker cinayetiyle ilgili dava sonuçlandı.

Another important problem is that the names of individuals under the age of 18 are easily reprinted. Turkish Cypriot media generally pays attention to the use of initials when suspects or victims are under the age of 18. However, in the case of İ.E., many newspapers published the name of the child, disregarding his age. They also stated the nationality of the individual unnecessarily, creating society throughout society. The story was published on 18 October 2016 by Evrim Kamalı on the Kıbrıs Manşet Internet Newspaper as follows.

Çocuk tecavüzü karara kaldı

Evrin Kamalı

KIBRIS MANŞET ÖZEL HABER

Lefkoşa'da 24 Haziran 2016 tarihinde Kızılbaş bölgesinde 5 yaşındaki kız çocuğuna askeri bölge içerisinde tecavüz eden Hataylı sanık dün Lefkoşa Kaza Mahkemesi bünyesinde kurulan çocuk mahkemesi huzurunda aleyhine getirilen suçları kabul etti.

" İ.E from Hatay (a city in Turkey), who raped a 5-year-old girl in military territory in Nicosia on June 24, 2016, accepted the crimes against him in the presence of a children's court established in the Nicosia Accident Court yesterday."

As a result of this news, images of the 15-year-old child were shared on Social Media, and there were also calls to lynch him. After the developments, security measures were implemented so that İ.E was secretly brought to the court to ensure that the process continued and representatives from the Social Services Department were present. In accordance with the decision taken by the court, the interview was held in a closed environment, which resulted in the press being restricted from obtaining information about the subject and that it was only heard from the outside.

A DELUSION FOR THE MEDIA; ALL THE PROBLEMS ARE BECAUSE OF ETHNIC ORIGIN

When the socio-economic situation of the Cypriot people is examined, it is clear that people believe that immigrants from Turkey are the cause of many problems that occur in the country. Particularly in recent years, it is commonly believed that the reason for the increase in murder, rape and theft cases in the country is due to the increase in the number of immigrants who have come Cyprus from Turkey. Therefore, in the above-mentioned rape case, the press used the nationality of İ.E, who was under 18 years old, in order to provoke the public and exploit it as a certain point of interest.

As stated in the United Nations Convention on the Rights of the Child in 1989, "Everyone under the age of 18 is defined as a child". The rights and fundamental rights of each child as a rights holder were unanimously adopted by the United Nations Convention on the Rights of the Child in 1989. According to the agreement, people under the age of 18 years have rights, regardless of their race, religion or ability, whatever their thoughts or sayings, and how they come from a family.

On the other hand, in the Turkish Journalists' Rights and Responsibility Declaration of Turkish Journalists, the regulations regarding the communication of information about children states the follow: "The names and photographs of children under the age of 18 must not be published if they are a suspect, a witness, or a victim of a child-related crime or sexual assault, and the child should not be interviewed or photographed without the permission of a journalist, a family member or someone else responsible for the child" (Gencil Bek, 2011, p. 38):

'VICTIM' AS A SOCIAL CONSTRUCTION

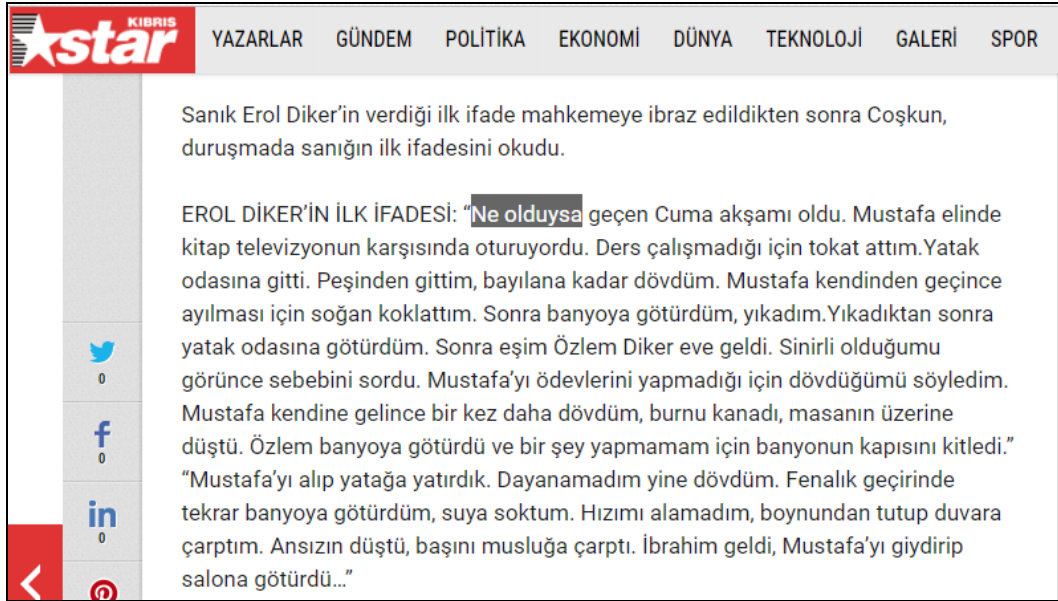
The definitions of the victim concept can be found in international texts. In the first paragraph of the United Nations Declaration adopted by the General Assembly Resolution 40/34 of 29 November 1985, the concept of a victim was identified. According to this, the victim is a person or community who is physically, mentally or emotionally endangered, has suffered economic loss, or has suffered serious damage to their fundamental rights due to acts that violate the criminal laws in force in member states.

Richard Quinney identified that the concept of the victim is shaped by personal and social values and that the victim is actually a social construct used as a means of social control by the power holders (Shalhoub-Kevorkian, 2004: 208).

For example, by analyzing judicial intervention in England for victims of rape, Lees claimed that the victims are being traumatized by the judicial system and defined it as "judicial rape" (Shalhoub Kevorkian, 2004: 210).

One of the most significant ethical violations in news about rape is to tell the news by creating a story. Although events transmitted in the court environment are used for clarification of the subject, the fact that the newspapers receive this information and place it as a story in the newspapers leads to individual results being detached from the social context of the subject.

Even though the incident involving Erol Diker was the first such event in the country, there have been similar examples around the world. Aside from the psychological dimension of the incident, the fact that it was presented as a story resulted in individual hatred of the father Erol Diker and the inability of the subject to be socially judged impartially.



In the story published in Star Kibris Newspaper dated August 17, 2012, by Suna Erden, with the headline "First I raped, then I killed" information about the incident was published with all the details. This story could even provoke individuals who are so inclined to perpetrate such actions themselves. The following statements were made in the article.

"Everything happened last Friday evening. Mustafa sat in front of the television reading a book. I slapped him for not studying. He went to the bedroom. I went after him and beat him until he fainted. Then I made him smell onions in order for him to wake up. Then I took him to the bathroom, washed him. I took him to the bedroom. Then my wife Özlem Diker came home. When she saw that I was nervous, she asked why. I told her that Mustafa didn't do his homework, so I beat him. When Mustafa came to, I beat him again and he fell on the floor. He fell on the table and struck his nose. Özlem took him to the bathroom and locked the door so I wouldn't do anything. We took Mustafa and laid him on the bed. I couldn't take it. I beat him again! When he fainted, I took him to the bathroom and put him under water. I grabbed him from his neck and hit him to the wall. He suddenly fell and hit his head on the tap. İbrahim came, dressed Mustafa and took him to the living room... It was night. We put the bed in the living room, I started sleeping with Mustafa. I woke up in the middle of night and saw Mustafa peeing in the bed. He was contorted, biting his tongue. I took him to the bathroom again, lost his balance and hit his head. He was stuck. Then I took him to the bedroom, let him sleep and I went back to living room and slept. In the morning I realized that Mustafa had died. Mustafa and I threw the body in the dump in Taşkent. Then, I remembered Mustafa's shoes were at home, so I called Özlem to put the garbage out."

It has always been observed witnessed that people are being targeted by the problems that they cannot cope with in their everyday or social lives. The mainstream media has the definition of 'we'. The definition of 'us' adopted and transmitted by the mainstream media is basically shaped by the ideology of the economic, politically dominant society. Accordingly, it is shaped by the 'Turk', 'Muslim', 'Sunni', 'Heterosexual', 'male', 'conservative' patterns with the concept of 'we' (Dirini, 2010: 63)

The incident was portrayed in the newspaper with all the details that were presented in the court. Consequently, when someone reads the abovementioned text, they will begin to hate Erol Diker. Moreover, after Erol Diker's guilt was proven and he was sentenced to life imprisonment and Diker appealed to alleviate the sentence, the public reacted to the case in advance, before the court had made a decision. Furthermore, it was observed that members of society were calling for inmates of the prison to commit the same acts to Erol Diker as he had done to his son. This position of the press was shaped by the reaction of the people. Therefore, the position of the press about the incident is the determining position of the increasing hate speech against the father who had been convicted of rape, and ultimately determined the public attitude.

CONCLUSION

It should be acknowledged that the "clicking" problem of Internet journalism is seriously shaping news headlines. In addition to using headlines that do not reflect the content of the news, there are also headlines that appeal to the readers' emotions. Some of these titles can be listed as follows: "Incredible detail in the Diker murder", "Raped, killed, found the sentence too long", "He denied he is his son", "Lifetime sentence in the shame case of TRNC", "Bone age of the rapist is 17"

Tecavüz etti, öldürdü. Cezayı da fazla buldu!
Öz oğlu 7 yaşındaki Mustafa Diker'e tecavüz ettikten sonra öldüren baba Erol Diker, cezasının düşürülmesi için Yüksek Mahkeme'ye başvurdu.



www.kibrisemlakmerkezi.com

Evrin Kamalı

Öz oğlu 7 yaşındaki Mustafa Diker'e tecavüz ettikten sonra öldüren baba Erol Diker, cezasının düşürülmesi için Yüksek Mahkeme'ye başvurdu.

KKTC'de, 2013 yılında büyük infiale neden olan ve "küçük Mustafa cinayeti" diye bilinen cinayet olayından ötürü müebbet hapis cezasına çarptırılan baba Erol Diker, cezasını çok bularak Yüksek Mahkeme'ye başvurdu.

7 yaşındaki öz oğlu Mustafa Diker'e müteakip defalar işkence ve tecavüz edip daha sonra da öldüren Erol Diker, avukatı Özkuş Özdevim aracılığıyla, beraat talebiyle 23 istinaf sebebi üzerinden

Although no scientific research has been conducted on the habits of readers throughout the country, it is observed that the readers generally read the headline and then visit the page, even many times, commenting on the subject after reading the headline. Therefore, the editorial selection of newspaper editors stands as the primary tool for directing the reader. The headline used by Gündem Kıbrıs Internet Newspaper "Raped, killed, found the sentence too long" makes reference to the appeal by the criminal Erol Diker. In the news, the newspaper aimed to influence readers before the court had made any decision.

TECAVÜZCÜNÜN KEMİK YAŞI 17

04.07.2016



Lefkoşa'da 5 yaşındaki kız çocuğuna tecavüz eden zanlının kemik yaşının 16 ile 17 yaş aralığında olduğu belirlenirken zanlı yargılanmak üzere 3 ay süre ile cezaevine gönderildi

Suna ERDEN



A story with the headline *"Bone age of the rapist is 17"* by Star Kıbrıs Newspaper received negative reactions for using the name of the suspect, so they attempted to fabricate a new story that the child's age was actually 17 and they claimed they had determined this from his bones. The mentioned issue has been criticized as an editorial self-laundering policy and that it was not appropriate to publish the name of a suspect under the age of 18, regardless of the verdict in the case.

While writing court stories, journalists should ensure that the news is plain, not exaggerated and as accurate as possible. In sensitive cases, the reporter should not easily reveal the suspect's name and should act with the belief that the suspect may be innocent. The correspondent should not assign blame to a suspect who has not been proven guilty by the court due to any emotional connection they have with the subject. It should not be forgotten that guilt in the eyes of the press is equated to being guilty in public opinion. One of the main reasons for the reaction of the public after the evidence revealed the innocence of the hospital owners, which was revealed in the "Abortion Case" that was announced last March, was to criticize the judge and even to claim that he made a judicial error. Ultimately, the decision made by the court did not receive approval from the society because the press had declared all hospital officials, doctors and employees guilty from the first days of the abortion case.

On the other hand, the media should play an informative role in the development and protection of children's rights. It should make informative publications under this role and should demonstrate create sensitivity for children's rights. In the United Nations Convention on the Rights of the Child, violations of fundamental children's rights such as education, health, access to social services and security should be socially handled and the state should remind the tasks as a task force. (United Nations Convention on the Rights of the Child, 1989).

"Until the offense of rape / violence has been fixed in the news coverage, the allegations of "murderer suspect", "rape suspect", "alleged rape", "allegedly committed murder" and the terms such as "killer" and "rapist" should not be used in reference to the suspects in the news." (Deniz Ş. Korap, Öze E. 2015, s.748).

It should not be forgotten that it is against the guiding principles of journalism to punish those who have not been declared guilty by the court. Regarding an ongoing case of judicial proceedings, it should not be forgotten that the only institution that can accuse the suspect is a court, and it must be treated accordingly.

"As is known, although the sexual abuse of a child is extremely widespread in almost all societies, the number of events reflected by official authorities is extremely limited" (Topçu, 2009)

Therefore, the importance of reflecting such news in the press is that it can be used to build societal consciousness and help governments to initiate work on the subject. "In terms of the functioning of the criminal justice system, it is important to have a viewpoint of the victim and the victim's rights. Victims should be encouraged to report to criminal authorities and the number unresolved cases should reduced on this count" (Demirtaş, 2005).

The fact that a group can be placed under suspicion by means of reporting on an individual who has committed a crime can have a detrimental impact on society. The publications that newspapers use to target a race have led to a disruption to the social equilibrium in today's society where cultures are mixed. It is evident that newspapers should take more responsibility at this point, showing more care when publishing news, and that editorial intervention should be implemented more effectively. As a control mechanism of the state, the Informatics Act must ensure that vigilance and supervision are conducted on a regular basis in order to prevent newspapers publishing news that is purely generated to create more clicks. In order for the Media Ethics Committee to function and apply sanctions appropriately, the work should be regulated and the work of the government should be supported by the community.

"Journalists should show respect to the privacy in sexual assault cases and children below 18 should not be compromised. The term "incest" should not be used in cases where children's names could be compromised." (Dursun, 2010, p. 26).

On the other hand, journalists should make particular efforts not to reflect the identity of the victim, and photographers should not publish images that expose the victims. The victim should be not treated in such a manner that would lead to physical, mental or emotional harm, and the rights of the individual should be carefully protected. Decisions are made to protect victims in the European Union. According to Article 8 of the Framework Decision of 15 March 2001, the EU recommended that member states should provide protection for victims. The right to protection also includes taking measures to prevent the disclosure of personal information and photographs, such as the physical protection of victims or their families.

While the news is being written, the journalist's role is to act as a mediator in putting the statements in the newspapers, without shaping hate and legitimizing the crime. Journalists should avoid incentive publications that give details of how a crime has been committed.

The journalists must refrain from declaring the offender guilty before a decision is announced by the court, and should make efforts not to use photographs. On this point, the editors should not pressurize the journalists to provide photographs of a particular incident or the victim or alleged perpetrator of a crime.

REFERENCES

- AKÖZ, E.(2005). "İnternet gazeteciliği diye bir şey var mı?" http://www.sabah.com.tr/yazarlar/akoz/2005/01/11/internet_gazeteciligi_diye_bir_sey_var_mi (Erişim tarihi: 11 Şubat 2016).
- ALAN, D (2013) Diker cinayetinde akılalmaz detay. Havadizs Gazetesi. http://haberkibris.com/diker_cinayetinde-akilmaz-detay-2013-03-26.html (Erişim 10/02/2017).
- ALAN, D. (2013). Diker Davası'nda flaş gelişme, Havadis Gazetesi <http://haberkibris.com/diker-davasinda-flas-gelisme-2013-05-15.html> (Erişim 10/02/2017)
- DEMİRBAŞ, T. (2005) Kriminoloji. Geliştirilmiş 2. Baskı, Ankara.
- DENİZ, Ş , KORAP Ö. E. (2015). Tecavüzün Haberleştirilmesinde Etik Sorunlar: "5 N 1 K Yetmez, Bir de Vicdan Gerek". Gaziantep University Journal of Social Sciences, 14 (4), 721-759. DOI: 10.21547/jss.256750
- DİRİNİ, İ; (2010) "Okur Yorumlarıyla Yeniden Üretilen Nefret Söylemi", Yeni Medyada Nefret Söylemi, Tuğrul Çomu (der.) içinde İstanbul: Kalkedon Yayınları, ss.55-93.
- DURSUN, Ç. (2010). "Kadına yönelik şiddet karşısında haber etiği," Fe Dergi 2, no. 1: 19-32.
- ERDEN, S. (2016) Sapık üç gün tutuklu kalacak. Star Kıbrıs, <http://www.starkibris.net/index.asp?haberID=231324> (Erişim 10/02/2017)
- GENCEL B, M. (2011). Medyada çocuk hakları ve etik ilkeler. M. R. Şirin (Haz.), Çocuk hakları ve medya el kitabı içinde (ss. 23-59). İstanbul: Çocuk Vakfı Yayınları.
- HANLEYKOSSE, S. (2007). "Race, Riches & Reporters – Do Race and Class Impact Media Rape Narratives? An Analysis of The Duke Lacrosse Case", Legal Studies Research Paper Series, Paper No. 2007-03, Louisville: University of Louisville Law School.

- KAMALI, E (2016) Askeri bölgede tecavüz, Kıbrıs Mnaşet, <http://www.kibrismanset.com/guncel/askeri-bolgede-tecavuz-h147180.html> (Erişim 10/02/2017).
- KIZMAZ, Z. (2006), “Şiddetin Sosyo-Kültürel Kaynakları Üzerine Bir Yaklaşım”, Fırat Üniversitesi Sosyal Bilimler Dergisi, Cilt: 16, Sayı: 2 s.247-267, Elazığ.
- KKTC Anayasası (1983) <http://www.mahkemeler.net/cgi-bin/anayasa/anayasa.doc> (Erişim: 10/02/2017).
- MEDYA ETİK KURULU (2014), "İnternet Gazeteciliği Deklarasyonu" <http://medyaetikkurulu.org/wordpress/index.php/hakimizda/internet-gazeteciligi-deklarasyonu/> (Erişim: 10/02/2017).
- SHALHOUB-KEVORKİAN, N. (2004). “Tecavüzün Kültürel Bir Tanımına Doğru: Filistin Toplumunda Tecavüz Mağdurlarıyla Çalışırken Karşılaşılan İkilemler.” Müslüman Toplumlarında Kadın ve Cinsellik. Pınar İlkaracan (der.) içinde, 207-242, İstanbul: İletişim.
- SONAY, M. (2013) Mustafa Diker Cinayet Davası'nda karar, Yenidüzen Gazetesi. <http://www.yeniduzen.com/mustafa-diker-cinayet-davasinda-karar-6287h.htm> (Erişim 10/02/2017).
- TOKAY, E, (2013) Küçük Mustafa cinayetinde şok itiraflar. Kıbrıs Gazetesi. <http://www.kibrispostasi.com/index.php/cat/35/news/87890> (Erişim 10/02/2017)
- TOPÇU, S. (2009). Cinsel İstismar. Ankara: Phoenix.
- WEEKS, B. ve HOLBERT, R. (2013). Predicting Dissemination of News Content in Social Media: A Focus on Reception, Friending, and Partisanship. Journalism & Mass Communication Quarterly, 213-232.
- YURDİGÜL, Y. ve ZİNDEREN, İ. (2012), “Yeni Medyada Haber Dili (Ayşe Paşalı Olayı Üzerinden Geleneksel Medya ve İnternet Haberciliği Karşılaştırması)”, The Turkish Online Journal of Design, Art and Communication – TOJDAC, Volume 2, Issue 3, s.81-91.

The Specific Situation of Vocational Education in Hungarian Language in Romania: Ict Vs. E-Learning

Katalin HARANGUS

*Sapientia – Hungarian University of Transylvania,
Faculty of Technical and Human Sciences,
Tîrgu Mureş, Romania
katalin@ms.sapientia.ro*

Zsófia-Irén HORVÁTH

*Sapientia – Hungarian University of Transylvania,
Faculty of Technical and Human Sciences,
Tîrgu Mureş, Romania
zsofiahorvath@yahoo.com*

Erzsébet SZENTES

*Sapientia – Hungarian University of Transylvania,
Faculty of Technical and Human Sciences,
Tîrgu Mureş, Romania
sz_liza@yahoo.com*

ABSTRACT

Nowadays in order to succeed in the labour market it is essential to have digital competencies, this does not only mean access to IT communication technologies and their usage, but it also comprises the possession of knowledge, skills and attitudes. In order to improve these there is a need of a proper approach which would refer to the whole educational spectrum; the conscious use of digital tools and methodology for educational purposes, teachers' continuous training in digital pedagogy and the digitization of curricula. In the present research we undertook the task to assess the quality of vocational education in Hungarian language in Romania from students' (provisions with ICT tools, access to communication technologies) and teachers' perspective (teachers' overload, infrastructural facilities, problems related to the curriculum). The sample of vocational education is representative; it is comprehensive to the network of vocational educational institutions in Hungarian language (28 technical colleges, 20 vocational schools, 2857 pupils, 119 teachers who teach specific subjects). Our survey has a diagnostic aim, because it undertakes the task to reveal and analyze the present situation, and it is also a niche research because it aims to create new possibilities using the data of the present survey, and this is indispensable for the improvement of vocational training.

Keywords: technical and vocational education, digital skills, teachers' overload, ICT tools

INTRODUCTION

Nowadays competitiveness and development on the labour market largely depend on possessing new information and communication technologies (ICT), their use in an innovative and effective way. Computers, mobile phones and digital technologies constitute an integral part of our lives and in many areas of our lives they offer the solution for the challenges we face daily (EU, 2014).

In the future one of the main barriers of economic development could be the labour force who does not have digital competences on a proper level. According to prognosis by 2020 Europe could face an expected shortfall of 825.000 employees who do not have ICT skills, and 90% of the work places will require basic ICT skills (EP, 2016). For more than a decade the European Union has recognized and made further steps in order to emphasize the importance of ICT in education. Among the main objectives of the Digital Agenda presented by the European Commission we can find that by 2020 in education and educational systems digital competencies and their importance should be more acknowledged (COM, 2010). One of its elements is the strategy referring to digital skills or e-Skills, the aim of which is raising competitiveness, productivity and employability. Europe has to create more attractive background conditions for innovation, development and new digital works. Europe also has to ensure that the qualification, skills and know-how of ICT staff meet the highest global requirements, and they maintain this level through lifelong learning (COM, 2014).

The European Commission in its work of enforcing vocational education and training (EU, 2012), among the main objectives for the period between 2011 and 2020 includes the considerable increasing of attractiveness of vocational education, the growth of participating in the training, promotion of active learning, as well as the preparation of new methods of vocational training in schools and work places using ICT technologies.

In the recent years the board of Romanian Educational Ministry responsible for vocational and technical education (CNDIPT) has regarded its call making vocational education and trainings more attractive, more effective and accessible by improving the digital supply of schools and by motivating, training teachers for using ICT tools, thus promoting the importance of lifelong learning and the idea that the young should become active participants of the labour market (CNDIPT, 2013). According to international surveys at the present moment Romania is the last country on the list of possessing ICT skills of intermediate and advanced level (CEDEFOP, 2012).

In the most recent motion of the European Parliament (EP, 2015) this urges the member states to include the new technologies in the learning process, to improve the ICT trainings and the teaching of digital skills at all levels in order to motivate the young to acquire ICT skills and to choose jobs related to this domain. Furthermore, it emphasizes that proper infrastructure has to be provided in schools, and since not all students possess ICT skills, it is more important than ever to make these tools and trainings accessible for everyone. It is the responsibility of educational systems to help students to prepare for their professional career. Spreading knowledge and skills, improving competencies on individual level can assure the economical development in a longer term, competitiveness and reducing unemployment. This is especially true for vocational education because in European countries only 30% of students who take part in vocational education continue their studies. Students who graduate vocational schools try to find work on the labour market (CEDEFOP, 2015).

In the training of digitally skilled labour force the competent/qualified teachers have a fundamental role. The schools, training institutions should better support opportunities for ICT-related courses, that are efficient and of high-quality, and should stronger promote the teachers' participation at these courses or their continuous professional education/ and generally their continuous professional education.

PRESENTATION OF SURVEY

In Romania the comprehensive strategy of improving vocational education is written for the whole educational system which treats education in minority languages as a melted element. Minorities can use effectively possibilities provided by law (vocational education is granted in everyone's mother tongue) only if they have a clear picture not only about the system of vocational education in Hungarian language, but they know the aims, requirements of all those who take part in this process (teachers, students, future teachers). It must also be emphasized that we speak about a system which is still taking shape; it was just in 2014 when the three- year-long, state vocational education in minority languages became possible (Ministerial Order 3136/2014, published in Official Gazette 132/2014, it has been of legal force since 24th February, 2014).

We have accomplished two researches for exploring the situation of vocational education in Hungarian language in Romania. Our first survey was carried out in the second semester of 2013-2014 and it analyzed the situation of vocational education in mother tongue in technical colleges, its problems from students' and teachers' perspective (Pletl, 2015, 2016). Our second research was carried out in the first semester of the 2015-2016 academic year and it focused on the situation of vocational education in Hungarian language in vocational schools; the conditions of teaching, from the perspective of its participants (teachers and students) (Pletl, 2017). Both researches are of national level; because they comprise the network of vocational education in Hungarian language showing the regional rates as well (isolated regions, transitional regions and blocks).

Our research focuses on just one part of the situation of vocational education (level of technical colleges) and on just one segment of it (the circumstances influencing the process of teaching and learning). In order to work out the development strategy of vocational education more surveys would be needed: employment guidelines, of labour market, and economical.

Our survey is gap filler, because with its data we can complement the situational report on vocational education in Hungarian language in Romania, and it is also very timely because the modernization of vocational education is in the centre of reforms of public education.

We placed strong emphasis on the provision with digital tools of vocational education in both researches and on teachers' attitude to using ITC tools during classes and on the identification of teachers' problems in the teaching-learning process. The sample was comprised of students who learn at Hungarian technical colleges (N=1892) in Romania and teachers who teach specific subjects (N=99), as well as students who study in vocational schools (N=965) and teachers of specific subjects (N=20).

In our research we would have liked to get a detailed picture about:

- which digital tools and what kind of school infrastructure ensure the access to communication technologies for vocational schools;
- what are the working conditions of teachers who teach specific subjects, which factors obstruct the fulfillment of effective education;
- which digital, educational tools support teachers' work;
- how does the use of digital tools materialize in education, and
- to what extent is the use of digital tools beneficial in the teaching and learning process?

We used questionnaires as measuring device which analyzed the access of ITC tools for technical college students (34 groups of questions, 11 lines of questions), and for students of vocational schools (30 groups of questions, 6 lines of questions). The questionnaire for teachers contained 24 groups of questions with 15 lines of questions and they referred to teachers' working conditions and ICT attitude, habits.

RESULTS

(1). ICT tools in vocational education

Analyzing the presence and roles of ICT tools in vocational education in Hungarian language in Romania, first we gathered information about what IT tools do students possess. According to the answers we can state that students' provision with ICT tools is significant. About 88% of them have a PC at home (desktop computer or laptop), and only 34% share a computer with the family, and 54% has their own computer as well. Students of vocational and secondary schools show similar results in their provision with ICT tools; they share a computer with the family or have their own computer in similar rates.

Students' internet access is also notable. 90% of them have connection via cable or wireless. Furthermore, 77% of students studying in vocational schools can connect to the internet through their smart phones or tablets. If we analyze the data as a whole, we can state that there are only 2% of the students who do not own ICT tools (computer, laptop, smart phone) through which they could have access to the possibilities provided by the internet.

There is no discrepancy between those students who own traditional mobile phones, no matter if they study in a secondary or a vocational school. There is more important difference among those who do not have smart phones or tablets, and those who have internet access through their smart phones or tablets. As long as 9% of students studying in vocational schools do not have and 77% have this tool, 24% of students who learn at technical colleges do not have and 61% have this tool. The difference may be due to the fact that the survey among those who study at technical college was one and a half year earlier, when many students did not have smart phones. According to recent surveys most of the students have smart phones.

Teachers' and students' answers are the same to the question: is there a computer room in the school. All vocational schools have computer rooms, and 95% of them have access to the internet. Analyzing the infrastructure of technical colleges, the result is similar: there is a computer room in each of them which has access to the internet, and 27% of them have wireless connection as well.

(2). Working conditions for teachers who teach specific subjects

More than 80% of the technical college teachers who took part in the research and 75% of the vocational school teachers teach more than 18 per week. 40% of technical college teachers and 30% of vocational school teachers teach between 18-22 hours per week. In both groups the number of teachers who have more than 22 hours of teaching weekly is high: in technical college 42%, in vocational school 45%. Only 17% of technical college teachers and 25% of vocational school teachers work 18 hours per week.

Apart from working at school, teachers spend much time to prepare for the classes. 70% of vocational school teachers spend more than 7 hours per week, and 59 % of technical college teachers do the same. There is only 10% in both groups who spend less than three hours per week to be prepared for the classes. [Table 1].

Table 1: Time spent for being prepared for the classes (%).

How much time did you spend on preparation?	Technical college	Vocational school
3 hours	11	10
3–6 hours	30	20
7–10 hours	35	40
more than 10 hours	24	30

The overload regarding teaching specific objects and the number of classes is similar, because technical college teachers and vocational school teachers teach 8-9 specific subjects in average in 5-6 different classes during a school year. The provision with textbooks is not proper either [Table 2], because we can see from the answers that in both groups provision with text books is just 65%, and technical manuals, which are the basic tools of high-quality vocational education are available only for half of the students. We found significant difference in the two groups in the use of workbooks and worksheets; technical college teacher have greater access to this educational tool (44%) than vocational school teachers (15%). There is a difference in the use of software needed for teaching specific subjects, in this case vocational schools proved to be better equipped.

Table 2: Teaching materials (%).

Available teaching materials for teaching specific subjects	Technical College	Vocational school
textbooks	65	65
workbooks or worksheets	44	15
visual aids	62	60
manuals	57	55
software for teaching specific subjects	36	50

Besides curriculum, textbooks and auxiliary materials used in the educational process, the quality of the educational process is highly influenced by the frequency of teachers' participation at educational courses /educational training. We grouped professional activities in three groups. Reading pedagogical literature or books related to teaching specific subjects is part of individual preparation. Results show that majority of technical college teachers usually read (57%) or often read (38%) literature related to specific subjects. Educational publications, books are read by fewer teachers, (20%) read them usually, and 50% often read them. Compilation of materials, worksheets is part of educational work: 49% usually do this, 39% often do this [Table 3]. Organizing study groups, having open classes help teachers to progress in their career, but these are not mandatory tasks, so everyone can decide on how often he undertakes such tasks. 32% of technical college teachers never organize and 16% often or usually organize study groups. The rates of open classes are similar, too: 16% never have, 56% seldom have, 26% often have and only 2% have them regularly. It can be concluded that the lack of these activities does not mean that teachers do not consider them important, but it rather means that they do not have time and energy for these extra activities. According to data the majority of teachers of vocational schools in Hungarian language in Romania participate at trainings (24% regularly, 46% often) and it is less frequent to take part at conferences (14% never, 53% seldom).

Table 3: The frequency of participating at professional activities (1-never, 2-seldom, 3-often, 4-regularly) (%).

	Technical college				Vocational school			
	1	2	3	4	1	2	3	4
Reads pedagogical literature	1	28	51	20	10	35	40	15
Reads literature related to specific subjects	0	5	38	57	0	5	40	55
Compiles teaching materials, worksheets	0	12	39	49	0	5	50	45
Leads study groups	32	52	10	6	50	40	0	10
Holds study groups	16	56	26	2	20	55	20	5
Participates at professional conferences	14	53	27	6	15	55	20	10
Participates at professional trainings	2	28	46	24	5	35	40	20

Among teachers at vocational schools the most frequent activities are the compilation of professional materials, worksheets and regularly reading specific literature and taking part at professional conferences. Presumably this way they try to countervail the lack of textbooks and auxiliary materials. However, it seems that professional activities which are not mandatory are not pursued, thus study groups are not organized, they rarely have open classes and contrary to teachers at technical colleges they do not or rarely participate at conferences.

We also asked teachers of specific subjects what they would suggest as supporting factor in order to reach effective teaching. This was an open question and one third of the teachers unanimously answered that for Hungarian vocational education there is a real need for Hungarian manuals, textbooks and computer software.

(3). *Traditional versus ICT*

We also measured with further questions to what extent do teachers use digital tools (computer, video projectors) in classroom activities, do they have classes in computer rooms, and to what extent are the reading materials they use digital.

Table 4 shows the utilization of digital tools in vocational education according to students. We can conclude that 11% of students of technical colleges and 21% of students of vocational schools did not experience the use of these tools during classes. The majority of them experienced the use of these ICT tools only at one quarter of their teachers during classes.

The possibility of using digital tools (computer, video projector) in classroom education is used differently by teachers. The use of these tools of teachers from technical colleges is more balanced, than in the case of vocational school teachers. There are just few (6%) who do not use digital technology at all during the classes. Most of them (44%) use digital tools in a quarter of rate and there are only 4% who regularly use ICT technologies during their classes. Compared to this 15% of vocational school teachers do not use e-learning tools, but 20% of them use only these aids during their classes [Table 4].

Table 4: The rate of digital tools (computer, video projector) used in classroom education (%)

The rate	According to students		According to teachers	
	Technical college	Vocational school	Technical college	Vocational school
0%	11	21	6	15
25%	43	38	44	30
50%	28	25	30	35
75%	14	11	16	0
100%	4	5	4	20

The use of possibilities given by computer rooms are not the best in vocational education. Despite the fact that figures show that teachers use ICT tools in classroom education, specific subjects are not taught in computer rooms using computers as educational tool. Half of the students do not acquire the knowledge, skills of ICT while learning their jobs [Table 5].

Teachers' opinion do not significantly differ from students' opinion. In spite of the fact that 85% of them use ICT tools in classroom activities in order to efficiently teach the material, only 41% of them use the computer daily or weekly in their preparation of the classes [Table 5].

Table 5: Specific subjects taught in computer rooms, using computers as educational tools (%).

	According to students		According to teachers	
	Technical college	Vocational school	Technical college	Vocational school
Daily	5	6	10	10
Weekly	29	26	31	30
Monthly	20	11	19	25
Half a yearly	14	14	26	25
Never	32	43	14	10

The rate of digital reading materials used by teachers differs a lot. 80% of technical college teachers use both digital and printed reading materials but mostly printed ones, 45% of teachers who teach specific subjects do the same and 45% of teachers choose digital reading materials only when they read anything they want not only specific literature [Table 6].

The use of digital materials related to the role of teaching also shows different rates. Most of the vocational school teachers (45%) prefer printed materials to digital ones, and most of the technical school teachers (42%) use both digital and printed materials for reading [Table 6].

Table 6: Teachers' reading habits (%).

The rate	Digital reading materials		Digital materials related to the role of teaching	
	Technical college	Vocational school	Technical college	Vocational school
0%	5	10	1	10
25%	41	25	33	45
50%	39	20	42	15
75%	12	35	23	25
100%	3	10	1	5

Analyzing to what extend are freely chosen reading materials digital, we can conclude that teachers of specific subjects use the possibilities offered by the internet. There is just a small group who demand printed materials for reading. If we compare the rate of digital reading materials we can observe that there is a difference: teachers' reading materials chosen freely are digital, whereas those related to their domain, to their teaching activity are printed. 45% of the reading materials chosen freely by teachers are totally or partially digital, and the materials connected to their educational work are 45% printed and not digital [Table 6].

(4). Teachers' e-attitude

In order to define teachers' e-attitude we analyzed different topics; which are the supporting and obstructive factors of teachers using digital tools more often, what do they prefer in classroom education e-learning or traditional methods/tools. According to teachers of specific subjects the most important factor in the effective educational work would be the access for students of the materials in digital format, too. Then, the access to computer simulations and animations related to special /technical subject were mentioned to facilitate the educational process. They considered less important the access of multimedia and auxiliary materials for the students and the access to interactive, e-learning materials were considered by them the least needed [Table 7].

Table 7: Supporting factors for using e-learning materials, ranked by teachers of specific subjects.

Ranking list technical collage	Supporting factors	Ranking list vocational school
1	The basic curriculum should be accessible for the students in digital format as well.	1
2	Computer simulations and animations connected to specific subjects should be accessible for students.	2
3	Multimedia materials should be accessible for students (sound, images, and videos).	3
4	Supplementary materials in digital format should be accessible for students.	4
5	Interactive e-learning materials should be accessible for students.	5

Ranking list done by technical college teachers and vocational school teachers referring to the facts that obstruct the use of e-learning materials in the educational work, which show differences only in the middle range [Table 8]. The most significant obstructions are that they do not have access to e-learning materials in Hungarian or other foreign languages, and the implementation of these is far too time-consuming. According to them they are good enough at computers, so they could use ready-made materials in the learning process, and they also agree on the idea that there is such motivation and support from school management. So, teachers who teach specific subjects are ready to use e-learning materials in their everyday work in order to make the teaching-learning process more effective, but there is

no time for this besides the preparation for classes. Among the listed factors it is worth talking about that fact that 30% of the teachers do not believe (technical college teachers 28,79%, and vocational school teachers 31,58%) that using digital materials would result more effective teaching-learning (Káta, 2015).

Table 8: Factors that obstruct using e-learning materials more often, ranked by teachers of specific subjects.

Ranking list technical collage	Obstructive factors	Ranking list vocational school
1	I do not have access to e-learning materials in Hungarian language (in my domain).	5
2	Their implementation in the learning process is too time-consuming.	1
3	There are few e-learning materials in my domain (in any language).	2
4	There are no tools at home for this (proper computer, internet connection, software).	4
5	I do not believe that it would result a more effective teaching and learning.	8
6	I do not have the competency for developing my own e-learning materials.	7
7	They would need constant development because of the rapid improvement of technologies.	3
8	There are no available tools for this in the school (proper computers, internet connections, software).	6
9	There is no motivation or support from the management of the school.	9
10	I am not so good at computers, so I could include ready-made e-learning materials in the learning process.	10

Teachers who teach specific subjects prefer traditional tools / auxiliary materials to digital ones in an optimal proportion to the former. They significantly like paper-based textbooks and personal presence to online courses and interactive online materials (vocational school: $x_{digital} = 45.25$, $x_{traditional} = 54.75$, $p < 0.05$, technical college: $x_{digital} = 35.53$, $x_{traditional} = 64.47$, $p < 0.05$).

CONCLUSIONS

Labour market keeps putting pressure on our education system, so our graduate students could have up to date and improving IT knowledge. There is hardly any among the newly created jobs where there would be no need for digital skills. Students need teachers who help them to acquire several skills they will need in their future career. There are a lot of things that influence students' learning outcome, but in educational establishments teachers have the greatest impact on students' achievement. (COM, 2016). They can inspire and help students to acquire better and high level skills.

Students of vocational education in Hungarian language in Romania possess proper electronic devices (of their own or at home) that ensure their access to e-learning content. Analyzing the infrastructure of vocational secondary schools we can state that each school has a computer room with proper internet connection that can ensure students the access to communication technology. However the data of the survey also tells us that more than half of the students do not have classes in computer rooms, and they do not use computers as educational tool at school. This leads to the conclusion that students do not have the opportunity to improve their digital skills in parallel with their profession, so they could obtain better work places.

Comparing the differences and similarities of the two educational forms we can state that there are several factors that obstruct the fulfillment of the effective learning (more than 22 classes per week, 8-9 subjects, lack of student's books and teaching tools). It also became clear that teachers who teach specific subjects show a renewal in using proper tools. There are more teachers who use digital tools during the classes, compared to those who use traditional methods, and there are several teachers who use these tools in order to be prepared for the classes. The shift is significantly hindered by the fact that they do not have access to e-learning contents in the domain they teach, and the inclusion of these contents into the educational process would be too long. This can explain why many teachers do not use the computer room, as educational tool, when teaching specific subjects.

REFERENCES

- Cedefop. (2012). *ICT skill levels on the rise*. European Centre for the Development of Vocational Training. Available from: <http://www.cedefop.europa.eu/EN/articles/20404.aspx>.
- Cedefop. (2015). *From education to working life*. The labour market outcomes of vocational education and training. Available from: <http://www.cedefop.europa.eu/en/publications-and-resources/publications/3063>.
- Cndipt. (2013). *National Center for the Development of Vocational and Technical Education (CNDIPT)*. Congresul educației, 14-15 June, București. Available from: <http://www.congresuleducatiei.ro/index.php?page=organizatori&id=10>.
- Com. (2010). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. *A Digital Agenda for Europe*. Brussels, 19.5.2010. COM(2010)245 final. Available from: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:52010DC0245>.
- Com. (2014). *e-Skills for Jobs in Europe. Measuring Progress and Moving Ahead*. Available from: http://eskills-monitor2013.eu/fileadmin/monitor2013/documents/country_reports/brochure/e-skills_monitor_broschuere.pdf.
- Com. (2016). *A new skills Agenda for Europe. Working together to strengthen human capital, employability and competitiveness*. Brussels, 10.6.2016. COM(2015)381 final. Available from: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016DC0381>.
- Ep. (2015). *Report on skills policies for fighting youth unemployment*. 2015/2088(INI). Available from: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A8-2015-0366+0+DOC+XML+V0//EN>.
- Ep. (2016). *Report with recommendations to the Commission on Civil Law Rules on Robotics*. 2015/2103(INL). Available from: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A8-2017-0005+0+DOC+XML+V0//EN>.
- Eu. (2012). *Supporting vocational education and training in Europe: The Bruges Communiqué*. Luxembourg: Publications Office of the European Union, doi:10.2766/14225. Available from: http://ec.europa.eu/dgs/education_culture/repository/education/library/publications/2011/bruges_en.pdf.
- Eu. (2014). *The European Union explained: Research and Innovation*. Luxembourg. doi:10.2775/74012. Available from: https://europa.eu/european-union/sites/europaeu/files/research_en.pdf.
- Káta, Z. (2015). Az IKT eszközök vs. az e-learning a romániai magyar tannyelvű középiskolai szakoktatásban. (ICT vs. e-learning in the Hungarian language vocational education in Romania). In Pletl Rita (Ed.): *Anyanyelvoktatás. A magyar tannyelvű szakközépiskolai oktatás helyzete*. (Mother-tongue education. The situation of the vocational education in Hungarian language). (pp. 22-35). Kolozsvár: Ábel Kiadó.
- Pletl, R. (2015). A vizsgálat általános bemutatása (A general presentation of the research). In Pletl Rita (Ed.): *Anyanyelvoktatás. A magyar tannyelvű szakközépiskolai oktatás helyzete*. (Mother-tongue education. The situation of the vocational education in Hungarian language). (pp. 9-21). Kolozsvár: Ábel Kiadó.
- Pletl, R. (2016). A vizsgálat kontextusa, célja, tárgya, módszerei. (The context, purpose, objective and methods of the research). In Pletl Rita (Ed.): *Anyanyelvoktatás. Adottságok és lehetőségek a magyar tannyelvű szakképzésben*. (Mother-tongue education. Features and opportunities of the vocational education in Hungarian language). (pp. 27-35). Kolozsvár: Ábel Kiadó.
- Pletl, R. (2017). A vizsgálat általános bemutatása. (A general presentation of the research). In Pletl Rita (Ed.): *Anyanyelvoktatás. A magyar tannyelvű szakképzés jelene és jövőbeli kilátásai*. (Mother-tongue education. The present and the future of the vocational education in Hungarian language). (pp. 8-15). Kolozsvár: Ábel Kiadó.

The Uses of Augmented Reality in Learning Sciences: A Review

Kumar Ravinder GILL

PhD. Student

McGill University

Montreal, Canada

ravinder.kumar@mail.mcgill.ca

ABSTRACT

The uses of emergent technologies such as Augmented Reality (AR) has changed the traditional educational paradigm by making learning ubiquitous through extending the learning environment to the extent where learners can take the ownership of their created knowledge. AR technologies are wearable systems which “sense properties of the physical world and overlay computer-generated visual, audio, and haptic signals onto real-world” objects in real time (Roesner, Kohno, & Molnar, 2014. p.88). Such an amalgamated AR system with other technologies (for example smartphones, tablets, laptops, etc.) can produce a compact environment that can offer pedagogical supports in designing dynamic learning environments (Johnson, Levine, Smith, & Stone, 2010). However, AR technologies which rely on the overlaying of data facility can prove a big threat in terms of breaching confidentiality, hacking personal information, inducing violence, identity crisis, discouraging anonymity, bullying, and respect. The central issue of this review is to navigate as to how AR enriched environment support and promote sociocultural, cognitive, pedagogical, and affective aspects of learning? To organize the review structurally, the conversation will start with a background of AR and its uses in education by reviewing AR technology in education and finally, the author discusses the potential threats regarding the uses of AR technology in education.

Keywords: Augmented reality, learning sciences, pedagogy

INTRODUCTION

Learning is an innate characteristic which is found in the human and other living organisms alike. Dillenbourg (1999) defines learning as a “biological and/or cultural process” (p.4) that takes place over several years; a joint problem solving in which learning is assumed to occur as a by-product of interactions. Learning is a process beyond the collection of factual and procedural knowledge, as it produces changes in the organism and the changes produced are relatively permanent (Schacter, Gilbert, Wegner, & Nock, 2014). Change in human behavior can be a sign of learning but this change is subject to many external and internal factors that may affect learning. For example, external factors such as learner’s heredity, home culture, and physical environment are crucial to achieving the desired learning outcomes. In addition, on the other hand, the internal factors include learner’s personality characteristics – attention, interest, aptitude, motivation, self-efficacy, beliefs, and persistence – are important to effect any change in learner’s behavior. Learning may take any forms – formal learning (directed and organized at some formal space e.g. school), informal learning (results from personal experiences and day-to-day interactions with people), incidental learning (occurs during interactions between teacher and student which is unplanned and a kind of incidental), and meaningful learning (deep and comprehensive learning which may allow to translate and transfer the learned knowledge to other branches of knowledge). To understand the possible shape, scope, and space of learning, we need to discuss learning sciences.

WHAT IS LEARNING SCIENCE

Learning science is a science that tries to “understand the nature of learning from a broad range of perspectives, and to shape the ways that learning environments and resources are designed and used” (Nathan & Wagner, 2010, p. 329). The multidisciplinary perspectives of learning sciences range from psychology (including cognitive, developmental, and educational psychology), education, computer science, neuroscience, anthropology, social linguistics, and sociology. The intersectionality of these multidisciplinary domains has affected the theories and practices of learning in education. For example, the cognitive, socio-cognitive, social-constructivist, and socio-cultural theories of learning have stemmed from the interactions among multiple disciplines that have shifted the educational paradigm from teacher-centered to learning-centered. Learning sciences cater to meet the needs of learners when these “investigate basic research questions about learning and learners, the role of social context and culture, and the nature of the design process itself” (Nathan & Wagner, 2010, p. 329). It is a kind of “eduneering” (Nathan & Wagner, 2010, p. 329) given its systemic approach which focuses on the design, implementation, evaluation, and redesign of innovative learning approaches and tools. Given the vast scope of learning sciences which is beyond the reach of this review, the aim of this paper is to discuss the uses and mis(uses) of augmented reality (technological learning science - ICT) in education from the lenses of socio-cultural aspects of learning. In this context, the uses of emergent technologies (e.g., AR) have been incremental to foster the learning-centered approach in education, for these technologies have offered new ways to counter the limitations of time and space by designing ubiquitous and realistic environments for learners. (e.g. eLearning, mlearning).

DEFINING AUGMENTED REALITY (AR)

The influx of varied emergent technologies in the recent years has changed the methods and tools of teaching and learning. For example, the uses of emergent technologies such as Augmented Reality (AR) has changed the traditional educational paradigm by making learning ubiquitous through extending the learning environment to the extent where learners can take the ownership of their created knowledge. AR technologies are wearable systems which “sense properties of the physical world and overlay computer-generated visual, audio, and haptic signals onto real-world” objects in real time (Roesner, Kohno, & Molnar, 2014. p.88). Such an amalgamated AR system with other technologies (for example smartphones, tablets, laptops, etc.) can produce a compact environment that can offer pedagogical supports in designing dynamic learning environments (Johnson, Levine, Smith, & Stone, 2010). The review will focus on a diachronic study of AR in education and how it will inform the educational practices in the future. The review starts the conversation with a brief discussion on the background of AR, its model, its types, and its uses in education followed by a literature review of AR technology in education, and finally the author discusses the potential dangers of using AR technology in the educational domain. The main questions that prompt the conversation include:

- *How does AR support and promote the cognitive, socio-cultural, personal, affective and pedagogical aspects of learning?*
- *What are the potential dangers of including AR in education without considering its role as affordances for the educational and pedagogical purposes?*

Klopfer and Squire (2008) define AR as a situation in which a real-world context is dynamically overlaid with coherent location context-sensitive virtual information. More specifically, Milgram, Takemura, Utsumi, Kishino (1994) have defined AR in a visual way as below (see Fig 1.):

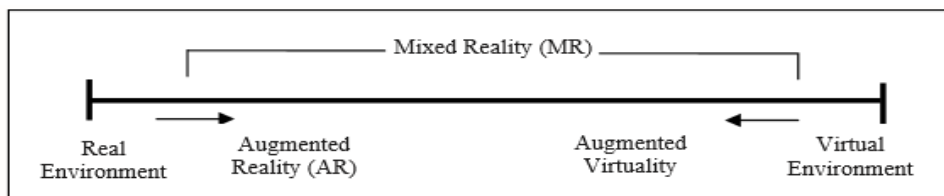


Fig.1. Milgram Reality-Virtuality Continuum

As in Fig. 1, the Mixed Reality (MR) has two main elements: one left side is augmented reality and the right side is augmented virtuality (AV). AR is a mix of the real and virtual object and consists of some amount of virtual data. In a nutshell, AR uses game-based models (i.e. based on game content and methods) in which technologies such as mobile phones (e.g. handheld devices), octopus rift (e.g. head-mounted devices) and other wearable gadgets (e.g. Google Glass) are used to create a mix of VR (Virtual Reality), AR and real-environments.

TYPES OF AR

Wojciechowski & Cellary (2013) have described three types of AR in use: marker-based AR, marker-less AR, and location-based AR. Marker-based AR uses markers. Markers are labels of colored or black and white pattern registered by the AR application captured via the camera of device. Marker-less AR recognizes the shapes of the objects. While the location-based AR superimposes information onto the geographical location of the user. Bacca, Baldiris, Fabregat, Graf, and Kinshuk (2014), have reported that marker-based AR (59.38%) is the most favorite type of its user followed by location-based types (21.88%). Chen, Ho, and Lin (2015) have offered a visual example of how markers and models work in learning as below (see Fig. 2.):

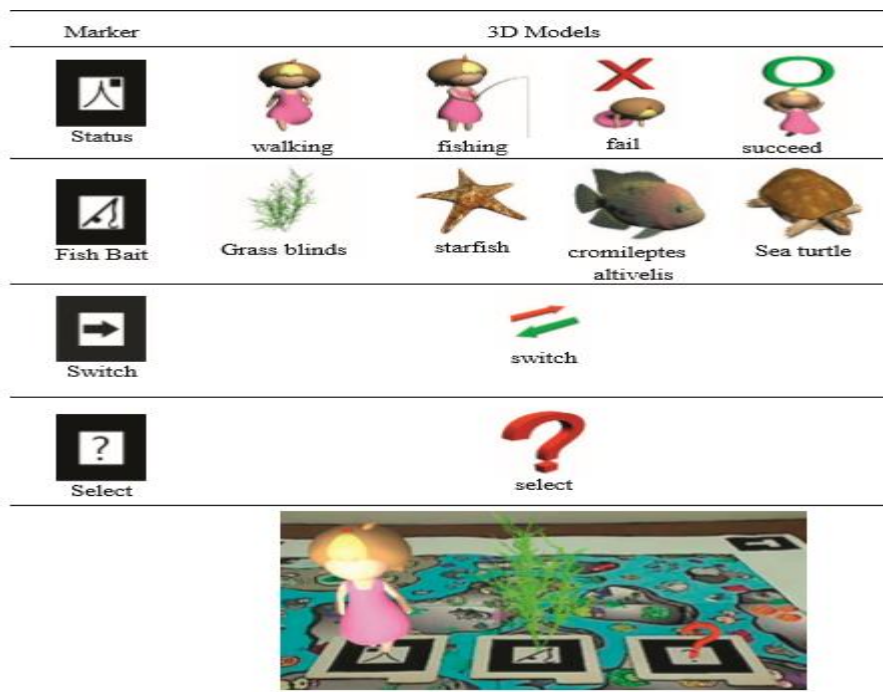


Fig. 2. Interactive markers and models (Chen et al., 2015, p. 218)

CONNECTING SCIENCE WITH EDUCATION

Education is a branch of science that facilitates the learning of knowledge, skills, values, beliefs, and habits. This facilitation is mediated through the learning sciences which incorporate the social, cultural, environmental, mental, physical, computational, and educational facets of learning and learners. In the next few paragraphs, the author will review how AR has made its ways in education, say, purposes and levels of the uses of AR education, its multidisciplinary uses in learning, and the potential mis[uses] of AR in education. Bacca et al. (2014) have conducted a systematic review of the trends of AR in education. The review enlists the following purposes of AR in education as shown below in the Fig. 3:

Purposes of the uses of AR in education

Sub-category	Number of studies	Percentage (%)
Explaining the topic	14	43.75
Evaluation of a topic	0	0.00
Lab experiments	4	12.50
Educational Game	6	18.75
Augment information	13	40.63
Exploration	1	3.13
Other purposes	0	0.00

Fig. 3. Purposes of the uses of AR in education (Bacca et al., 2014, p.140)

As indicated in the Fig. 3., AR is used primarily for the purposes of explaining the topic (43.75%) and augment information (40.63%) in educational settings. The rationale for such uses of AR to connecting with previous knowledge of the learners (as advance organizers) and to make the information more dynamic and lively for longer retention.

Levels of education AR in use

Sub-category	Number of studies	Percentage (%)
Early childhood education	0	0.00
Primary education	6	18.75
Lower secondary education	6	18.75
Upper secondary education	4	12.50
Post-secondary non-tertiary education	0	0.00
Short-cycle tertiary education	1	3.13
Bachelor's or equivalent level	11	34.38
Master's or equivalent level	0	0.00
Doctoral	0	0.00
Informal Learning	2	6.25
Not mentioned in the study	2	6.25

Fig. 4. Levels of Education AR in use (Bacca et al., 2014, p.140)

The Fig. 4. shows that at the undergraduate level (34.38%) AR is more active. The reasons for such an intensity at this level may be learners' needs for collaboration in projects, the domains of the study, and the nature of the inquiry to be investigated. At the kindergarten and post-secondary non-tertiary level, the negligible uses of AR (0.0%) signal to the lack of exposure or intent to employ the AR technology. Interestingly, at the primary and junior high school levels, the uses of AR are recognizable as to comprehend the concepts of content and processes.

AR TECHNOLOGY IN SOCIOCULTURAL LEARNING

Some studies (Tu, & Jyh Yen, 2007; Johnson, Levine, Smith, & Stone, 2010), have reported that online technologies and especially AR are capable to push the constructivist school of thought. Papert and Harel (1991) remark that design-based learning is grounded in the constructivist paradigm that posits that students' understanding of their world is best developed when they actively create real objects. Since learning is a "social" (Bandura, 1977) act, the potential of AR in fostering the transaction of ideas and interests among learners is manifold. To accommodate the socio-cultural aspects of learning in its entirety, teachers can use the affordances of AR to create learning spaces which are geared toward the learners' individual, familial, institutional, social, and cultural orientations. This notion of diversity of learners makes learning a sum of environmental interactions which is facilitated by the transactions between and among learners, teacher, and environment. Designing learning experiences include the designing of the physical, social, cultural, and psychological spaces for learners. AR offers both teachers and learners alike the potential to design teaching and learning experiences to promote diversity in the classroom. It offers viable and feasible alternatives to translate the complexity of learning concepts and turn them into an interactive, entertaining, collaborative and engaging experiences. Through AR facilitated information overlays, students can engage themselves in creative learning by making deep and lasting connections with their knowledge base (Kerawalla,

Luckin, Seljeflot, & Woolard, 2006). In a way, AR offers many affordances to design such environments where learners' diversity – ethnicity, culture, class, and geography – can intersect and collaborate. As AR thrives on design-based models, it has potential to accommodate the sociocultural diversity of learners significantly. In this sense, AR can provide ample opportunities to navigate the unexplored possibilities for creating diverse content of socio-cultural dimensions which traditional pedagogical strategies often does not.

Given the diverse nature of modern classroom, teachers need to understand and accommodate the structure of classroom which consists of a variety of learners belonging to multiple ethnicity, cultures, classes, nationalities, and learning styles. When teachers use the affordances of AR, they can create simulated scenarios catering to a specific group of learners to enhance the learners' experiences about that group culture. For example, AR-based games can be useful to make students understand how power structures work in the social and institutional milieu and what are the covert or overt superstructures (e.g. language, religion) put in place to marginalize a certain group of people in society. Consequently, a developed understanding of the socio-cultural aspects imparts more opportunities for collaboration, engagement, motivation, and cultural connection among learners in a diverse classroom.

CREATING THE CURRICULUM AND PEDAGOGY USING AR TECHNOLOGY

The curriculum is a dialogic document that mediates between a teacher and learner. Designing an interactive curriculum for diverse learners to voice their cultures, languages, classes can help them feel organically attached to it. AR can offer many possibilities to design a curriculum which may accommodate the diversity of learners. Secondly, AR can be embedded in the pedagogy of a curriculum at the designing stage. AR as pedagogy can help experiment and apply multiple scenarios to understand various aspects of equity and diversity to represent the diverse experiences of a curriculum. For example, the tools of AR in the instructional strategy can offer affordances to exploit the maximum senses (visual, auditory, neurological and tactile) in learning.

Furthermore, the mobile-based AR technologies can be used to help international students accommodate them better in new cultural settings. Similarly, AR tech-pedagogy can be more vital in a diverse classroom where teachers need to create scenarios which are, sometimes, not feasible in real-life settings given the cultural and religious restrictions. For instance, some culture, say, South Asian people are less open in comparison to European and North American people regarding the matters of sex education and other aspects related to their personal lives. In this context, AR enriched environment can create a meeting point to raise cultural awareness between students' cultures and the associated beliefs of their cultures about sex and other personal aspects of life.

AR AND COGNITIVE SCIENCE

AR embedded environments can prove to reduce cognitive load on learners. *Cognitive load* (Sweller, 1988) is the total amount of mental effort being used in the working memory. Since working memory has limited information processing space at one point of time, the cognitive load on learner increases. In this situation, AR enriched environment can reduce the extraneous load which is unnecessary (that is the way information is presented to learners). To do so the instructional/curriculum designers need to explore the alternative ways of presenting the content. For example, using visual and graphic items instead of verbal and oral narratives to explain any mathematical figures, say triangle, square among others can be helpful to teach better and longer. This change in the presentation may result in better processing of the information by offering longer retention and better compartmentalizing of information to long-term memory (germane load) of learners.

AR IN THE PERSONAL, SOCIAL, AFFECTIVE SKILLS ENRICHMENT

Engagement, Collaboration, and Motivation

Collaborative learning has taken a granted place in the current enterprise of teaching and learning. Collaborative learning necessitates that learners need to be dialogic and engaging. AR as a technology can provide tools and techniques to engage learners and then enable them to collaborate consistently. Squire and Klopfer (2007) say that AR can stimulate learners' prior knowledge and can enhance their levels of engagement in academic activities. It is so because the learners enter the classroom with their great funds of knowledge. The proper use of learners' knowledge can help understand their levels of competence and needs. Once learners' previous knowledge is activated, the possibility to affect meaningful learning increases. For example, Ardito, Buono, Costabile, Lanzilotti, and Piccinno (2009) have presented a Mobile Augmented Reality (MAR) game called *Explore* to scaffold collaboration among learners. The findings of Ardito, et al., (2009) reported that the game *Explore* helped to support and collaborate the middle school students in groups during a project at the archaeological sites in Italy. Such a collective experience obtained in groups can help create newer group projects based on those collaborative learning. In addition, AR can enhance collaboration between students-students and student-instructors (Billinghurst, 2002) resulting in the maximum transfer of learning (Kaufmann & Schmalstieg, 2003).

Motivation is a necessary condition to achieve the desired educational goals. AR has potential to motivate learners at both content and methods levels. A study by Di Serio, Ibáñez, and Kloos (2012) has found that AR technology can have a positive impact on the motivation of middle-school students. An environment designed with AR technology can create students' interests in the content and can retain them for a longer time through constant motivation. Other studies (Radu, 2012; Radu, 2014) on comparing the student learning in AR versus non-AR applications have reported the positive effects of AR in the experimental condition. For example, AR supported groups had many benefits over non-AR groups. These included increased content understanding, learning spatial structures, language associations, long-term memory retention, improved collaboration, and motivation.

AFFECTIVE ASPECT: PERSONAL BELIEFS

Rokeach (1972) defined a belief as "any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase such as 'I believe that...' (p. 113). Teacher and students' beliefs are the valuable assets in the enterprise of teaching and learning. Both teacher and students alike hold their certain beliefs when they interact during learning discourses. AR technology can set a stage for both teacher and students to understand their mutual belief systems which are very crucial for the meaningful learning. For example, AR technology can offer help in designing games and simulators to which both teachers and students can expose their personal biases and prejudices, otherwise difficult to surface them in daily conversations without inflicting others. This exercise of playfulness will help teachers and students alike to negotiate their biases. Thus, a change in beliefs may occur and may enhance the engagement in the classroom.

POTENTIAL DANGERS OF USING AR TECHNOLOGIES IN EDUCATION

Though there are many advantages of employing of AR in education from pedagogical and environmental perspectives, it has numerous dangers of unprecedented nature with a sizable negative impact on its users and used ones. AR technologies which rely on the overlaying of data facility can prove a nightmare in the cases of breaching confidentiality, hacking personal information, inducing violence, identity crisis, discouraging anonymity, bullying, and respect (Roesner, Kohno, & Molnar, 2014). For example, the issues associated with the privacy, breach of confidentiality, and bullying, have come up with the dark side of AR. A longitudinal study is warranted to investigate the actual gains of AR technologies in this reference. In this last section, the author discusses the limitations of AR technologies in education.

CONCERNS TO PRIVACY AND THE BREACH OF CONFIDENTIALITY

AR technologies such as Google Glass (GG) have been reported for the potential dangers to individual privacy. Champion (2013) in his article, *Thirty-five arguments against Google Glass*, highlights the harms the Google Glass can do. For example, the Google Glass may keep a panoptical surveillance over the social, personal, cultural and possibly even psychological aspects of an individual. Similarly, as discussed in the same article, GG may restrict the social circles by ceasing the interactions among people. Furthermore, AR faces privacy questions that fall into two groups: the viewing of information and the information itself. Questions such as Who will be able to see the display apart from the user? What information will be posted? Are still seek answers. In the same vein, Mistry, Maes, and Chang (2009) have developed AR technologies such as WUW (Wear Ur World) that can recognize people and can display their social networking activity (Berryman, 2012) as well.

Furthermore, AR technologies have reported the negative impact on various classroom activities – attention tunneling, usability difficulties, ineffective classroom integration, and learner differences (Radu, 2012; Radu, 2014). Firstly, it is not possible for each teacher to create new learning content and use it effectively in the classroom. Secondly, the issue of paying too much attention to virtual information is another issue which may affect learners' focus on learning process (Bacca et al., 2014). Thirdly, the designing of AR rich environments is quite expensive. For example, the Head Mount AR technologies are difficult to provide to each student. Lastly, AR technologies are quite new in the domain of education and the effective uses of these technologies need training on the part of teachers. Preparing teachers for the transition from old to new pedagogy is subject to their beliefs, attitudes, and individual resistance.

CONCLUSION

Like any new technologies, the use of AR is also surrounded by doubts and questions regarding its applicability and sustainability in education. AR has proved its mental in the fields of medical sciences, auto industries, defense, and to some extent in education. The uses of AR in education, no doubt, can extend the possibilities of learning in the areas of creating learning environments, the ubiquity of learning, and blurring the boundaries between formal and informal learning. Further, AR technologies have offered alternatives for the experimentation and change in pedagogy via employability of the newer and varied instructional methods and techniques. For example, in STEM education, the progress is phenomenal. AR has provided more options for accommodating diversity and maintaining equity in education through its collaborative and engaging approach.

Furthermore, the uses of AR in education have made possible for teachers and students alike to understand each other and change their beliefs for good. Similarly, student motivation has also been affected by AR leading technologies. With the enhanced motivation, students may increase their learning outcomes. AR may prove instrumental in reducing attrition rates via its engaging and multimodal approach.

Though there are many positives of using AR in education, the dangers of its misuse cannot be denied. There is a need to reconsider the issues of its navigability and access in education. Issues of privacy and confidentiality need to be addressed before any free play of this technology in educational corridors. On the whole, AR is a great tool to be explored in its variability in the current ICT paradigm. Though the potential of AR has offered many educational tools, the meticulous handling of this technology in classroom needs adequate education and training for both teachers and students before they apply it in the real settings. In addition, a political will is also needed to introduce this technology in schools and universities as it requires a sizable investment. Lastly, the educators must have positive attitudes and strong intent to make the transition from old to new technologies.

REFERENCES

- Ardito, C., Buono, P., Costabile, M. F., Lanzilotti, R., & Piccinno, A. (2009.). Enabling interactive exploration of cultural heritage: an experience of designing systems for mobile devices. *Knowledge Technology and Policy*. 22, 79-86.
- Bacca, J., Baldiris, S., Fabregat, R., Graf, S., & Kinshuk. (2014). Augmented Reality Trends in Education: A Systematic Review of Research and Applications. *Educational Technology & Society*, 17 (4), 133-149.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, N.J: Prentice Hall.

- Berryman, D. R. (2012). Augmented Reality: A Review. *Medical Reference Services Quarterly*, 31(2), 212-218.
- Billinghurst, M. (2002). Augmented Reality in Education. New Horizons for Learning, December 2002. Retrieved from <http://www.newhorizons.org/strategies/technology/billinghurst.htm>
- Champion, E. (2013, March). Thirty-Five Arguments Against Google Glass. *Reluctant Habits*. Retrieved from <http://www.edrants.com/thirty-five-arguments-against-google-glass/>
- Chen, C. H., Ho, C.H., & Lin, J.B. (2015). The Development of an Augmented Reality Game-based Learning Environment. *Procedia - Social and Behavioral Sciences*, 174, 216-220.
- Di Serio, Á., Ibáñez, M. B., & Kloos, C. D. (2012). Impact of an augmented reality system on students' motivation for a visual art course. *Computers & Education*, 1-11. Elsevier Ltd.
- Dillenbourg, P. (1999). What do you mean by 'collaborative learning?' In P. Dillenbourg (Ed.), *Collaborative-learning: Cognitive and Computational Approaches* (pp.1-19). Oxford: Elsevier.
- Harel, I., & Papert, S. (1991). *Constructionism*. Norwood, N.J: Ablex Pub. Corp.
- Johnson, L., Levine, A., Smith, R., & Stone, S. (2010). Simple augmented reality. *The 2010 Horizon Report*, 21-24. Austin, TX: The New Media Consortium.
- Kaufmann, H., & Schmalstieg, D. (2003). Mathematics and geometry education with collaborative augmented reality. *Computers & Graphics*, 27(3), 339-345.
- Kerawalla, L., Luckin, R., Seljeflot, S., & Woolard, A. (2006). "Making it real": exploring the potential of augmented reality for teaching primary school science. *Virtual Reality*, 10 (3-4), 163-174.
- Klopfer, E., & Squire, K. (2008). Environmental Detectives – the development of an augmented reality platform for environmental simulations. *Educational Technology Research and Development*, 56 (2), 203-228.
- Learning sciences (n.d.). In *Wikipedia*. Retrieved from https://en.wikipedia.org/wiki/Learning_sciences
- Milgram P., Takemura H., Utsumi A., Kishino F. (1994) Augmented reality: a class of displays on the reality-virtuality continuum. *SPIE proceedings: telemanipulator and telepresence technologies*, Boston, MA.
- Mistry, P. Maes, P. & Chang, L. (2009). "WUW - wear Ur world." *Proceedings of the 27th international conference extended abstracts on Human factors in computing systems CHI EA '09*. Boston, MA, USA.
- Nathan, M. J., & Wagner, A. M. (2010). Learning sciences. *Wiley Interdisciplinary Reviews: Cognitive Science*, 1(3), 329-345.
- Radu, I. (2012). Why should my students use AR? A comparative review of the educational impacts of augmented-reality. *Proceedings of IEEE International Symposium on Mixed and Augmented Reality (ISMAR)* (pp. 313-314). IEEE. doi:10.1109/ISMAR.2012.6402590
- Radu, I. (2014). Augmented reality in education: A meta-review and cross-media analysis. *Personal and Ubiquitous Computing*, 18(6), 1533-1543.
- Roesner, F., Kohno, T., & Molnar, D. (2014). Security and Privacy for Augmented Reality Systems. *Communications- Acm*, 57 (4), 88-97.
- Rokeach, M. (1972). *Beliefs, attitudes and values*. San Francisco: Jossey-Bass.
- Schacter, D. L., Gilbert, D. T., Wegner, D. M., & Nock, M. (2014). *Psychology*. New York: Worth.
- Squire K, Klopfer E (2007) Augmented reality simulations on handheld computers. *J Learn Sci*, 16(3), 371-413
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257-285.
- Tu, C. H., & Yen, C. J. (2007). Online socio-cultural learning. *International Journal of Continuing Engineering Education and Life-Long Learning*, 17(2-3), 99-120. DOI: 10.1504/IJCEELL.2007.013658
- Wojciechowski, R., & Cellary, W. (2013). Evaluation of learners' attitude toward learning in ARIES augmented reality environments. *Computers & Education*, 68, 570-585.

Training of Students-Philologists the Methods of Conducting Content Analysis

Mussatayeva Manatkul SHAYACHMETOVNA

*Abai Kazakh national pedagogical university
Almaty, Kazakhstan
mussatayeva@mail.ru*

Kuatova Gulzira ABIBUKIROVNA

*Abai Kazakh national pedagogical university
Almaty, Kazakhstan
gulzira_kuatova@mail.ru*

Nussupbekova Aizhan SEYSENALOVNA

*Abai Kazakh national pedagogical university
Almaty, Kazakhstan
aizhans70@mail.ru*

Yesirkeyeva Dinara AYDAROVNA

*Abai Kazakh national pedagogical university
Almaty, Kazakhstan
es.dinara@mail.ru*

ABSTRACT

This article is devoted to the method of teaching students-philologists to conduct content analysis by identifying ways of representing futural semantics in postmodern literature. The advantage of this method lies in the possibility of a formalized study of the semantics of the artistic text to identify ways and means of its expression, on the basis of it is possible to make valid and reliable measurements and conclusions. Training of students-philologists, whose all future professional activity is connected with the development of various kinds of texts, conducting of content analysis, requires a special developed methodology. The effectiveness of the methodology proposed by the authors of this article is achieved through an algorithm of actions that provides a clear sequence and a systematic approach of conducting content analysis. specific goal and tasks are set and solved at each stage of the implementation of content analysis. The proposed methodology, based on the principles of gradualness, formalization, semantic and statistical significance, was widely approved in the student audience. Its effectiveness is confirmed by the results of the pedagogical experiment.

INTRODUCTION

Modern technologies of teaching any language at school or university are concentrated on contextual basis of language units which is explained by the unique role of the language in the cognition of the world by a person.

Addressing to the semantic aspect of the language is actual both in the research of statements and in text study. An artistic text in this case is the invaluable source of factual material suggesting the variants of different use of language units of various levels.

In studying the plan of artistic work the content – analysis is the most effective one among numerous methods of semantic analysis widely used in texts analysis in various sciences such as sociology, polytology, history, psychology, linguistics, etc. Depending on the set objectives and studied texts the content – analysis method can vary and function in scientific literature under the various names, which are described by the scientist D.B.Lande (2006) in details. They are: method of objective quantitative and systematic study of the content of communication means (D.Jery, Dg.Jery); systematic digital processing, evaluation and interpretation of the form and content of information source (D.Mangeim, R.Rich); quantitative – qualitative method of studying documents (V.Ivanov) and others. However, the variety of names does not change the method itself which is in the objectivity of conclusions and strongness of procedure, consisting in mathematical processing of the text with the further interpretation of results. In content – analysis quantitative description of meaningful elements of text content, counting its objective properties allows a researcher “read between the lines” and disclose the hidden meaning which is intuitively guessed by the researcher, prove it scientifically which is rather difficult to do using traditional methods of studying artistic work. That is why, it is becoming obvious that nowadays philology – students – future linguists and writers, studying at university must acquire different methods of semantic analysis, including content - analysis method as well as the habits of their practical usage fully. Basing on this lingua-didactic thesis the aim of this article – is teaching philology – students methods of semantic analysis on the example of content – analysis of the concrete artistic text. The object of the article – is content –

analysis method, the subject – method of using the content – analysis to identify the semantic structure of artistic text. Methods, used in the article are: descriptive, interpretational, method of qualitative characteristics, content – analysis, analysis and synthesis,

THE STUDY

Depending on the character of factual material a number of definitions of content – analysis is suggested in linguistic literature. As the material of our research is an artistic text we keep to the definition of content – analysis, given in R.V.Manekin's work" ... a method, supposing the formalized study of texts content for the purpose of identifying and measuring social, cultural, mental peculiarities including in it." (Manekin, 1991).

Monitoring of scientific literature, devoted to content – analysis allows us to judge the multi-dimensionality of the given phenomenon: from the description of differences in the content of communicative processes in various countries to the definition of intentions and other features of communication participants (Berelson, 1952). This situation calls for the necessity of elaborating the algorithm of actions to use the content – analysis in every definite case of its usage. Accordingly, the following algorithm has been developed:

- ✓ concretization of the research aim and objectives;
- ✓ the choice of definite artistic text;
- ✓ the definition of units of text analysis;
- ✓ identification of language units in the text;
- ✓ analysis of the structure of the identified language units;
- ✓ structural classification of language units;
- ✓ characteristics of its semantic structure;
- ✓ the definition account unit;
- ✓ quantitative characteristics;
- ✓ construction of graphic data;
- ✓ Interpretation;
- ✓ Conclusions.

Let's consider separately each of the above mentioned algorithms.

It should be noted, that in the frames of this article the use of content – analysis is aimed to identify the future semantics in post modernistic literature.

Concretization of the research aim and objectives

Students are explained that to start any scientific work it is necessary to define the aim and objectives of the research. In our case, the aim of conducting the content – analysis is to identify all possible representatives of functional – semantic field (further FSF) of the future. To achieve the set aim the following objectives should be fulfilled:

- ✓ to identify and describe all possible representatives of future meaning in artistic text – analysis units, language (linguistic) units, directly subjected to analysis;
- ✓ to determine the frequency of using representatives being the constituents of futural field – account unit, quantitative measure analysis

The choice of specific artistic text

In realizing this point of the algorithm it is necessary to clarify the students such concepts as "general population" and "sample" in metalinguistics. Under the general population is understood a set of objects united by definite quantitative and qualitative properties, subjected to studying. All works or one work of a certain author, the literature of any epoch or chosen texts, etc. can be considered as general population. The advantage of "general population" is the possibility of full and developed study of this or that problem, and the disadvantage – is the problem of processing and analyzing extremely large volumes of texts. In this regard there is a need for reduction of research material in the way the selected artistic units could fully, objectively and reliably enough represent the properties of general population. Such system of material selection when the received results would be inherent in the phenomenon in general is called "a sample" in scientific literature (Sidortsev, 2003).

In the selection of research material the problem can appear in determining the character of a sample which can be casual, mechanical and serial, or nested; structural or non-structural, etc. K.Marten's sample typology is a bit different from the above mentioned types and is characterized by scientists as a full one (Levitskii, 2007) and includes optional and conscious (established in advance) ways of material selection (Merten, 1983). In *optional selection* the analyzed units get out of the text or the dictionary at random. In *conscious selection* it is supposed that a researcher, to some extent, is familiar with the peculiarities of the analyzed material. Standard sample is also called as "zone sample" or "typical sample" and represents preliminary grouping of texts on certain signs, for example, belonging to certain functional style, genre, epoch, etc. The following process of material sample, i.e. "selection" of analyzed texts is made directly from these groups.

We have chosen the authors' works whose creativity is related to literary direction of postmodernism to conduct the content – analysis. To narrow the volume of material we also make the selection on genres – the stories of post-modernist writers as V. Pelevin, L. Petrushevskii, A. Zhaksylykov, G. Korolyeva are the sample units (depending on the aims of research certain fragments could be selected). Such sample allows study possible representatives of future semantics in post – modernist texts, to make their quantitative and qualitative analysis, on the basis of which it is possible to determine the structure of FSF of the future with an arrangement of components concerning the center and the periphery. We suggest the content – analysis of only one work – Lyudmila Petrushevskaya's story "Night time" within this article.

Determining the units of text analysis

After determining the sample units we start the selection of unit analysis. The students are explained that in the content - analysis the unit analysis could be: 1) a word, 2) a sentence, 3) theme, 4) an idea, 5) the author, 6) a character, 7) social situations, 8) text parts, joined with some meaning, corresponding to analysis category. However, when the only method of receiving information is the content – analysis it is possible to operate several unit analyses simultaneously. In the selection of constituents FSF of futures we find out the semantic units – the meaning of the future which can be expressed by various structural elements: word, word – combination, subordinate clause and others. All the representatives of the future meaning found in the texts, which are necessary to allocate when reading by semantics, are the analysis units. On this stage of work only the units of text analysis are allocated which would be explained on the stage of analysis of language units.

Analysis of the structure of the identified language units.

To start the analysis of language units it is necessary to explain the students the meaning of each way of representation of the future meaning: morphological, lexical, lexical-syntactical, syntactical, non-verbal, modal - futural and contextual meanings.

We explain to students that grammar tense is related to morphological way, i.e. the verbs of the future forms (simple and compound) are expressed with perfect and imperfective verbs as well as with the combination of auxiliary verb with the short form of participle. For example:

Согнет или посадит или положит (*М) — как ему будет угодно (Bend or plant or put (* М) - as he pleases)

Я тебе во всем *пойду* навстречу (*М), зачем он нам? (I'll meet all your needs (* М), why do we need it?)

Друг *вынужден был удалиться* (*М) (A friend was forced to leave (*М).

Only those constructions with modal meanings which assume the future plan, i.e. those statements in which a speech subject states the message as unreal, i.e. as possible, desirable, preposterous, doubtful, etc. are related to modal – future way of representation Unreal modality is divided into:

1) modality of obligation and necessity (debitive modality), for example: *Я тоже сказала, что мне надо быть* (*МФ) *в одиннадцать в одном месте...* = «Х говорит о том, что в определенное время после момента речи, т.е. в будущем, должен совершить определенное действие, т.е. быть в одном месте. Значение необходимости в данном случае выражено предикативом *надо*». (I also have told that I need to be (*МФ) at 11 in one place... = "X says that at definite time after the moment of speech, i.e. in the future he must do a definite action, be in one place. The meaning of necessity in this case is expressed by the predicative *need*").

2) modality of possibility and impossibility (potential modality), for example: *Это я, да, но это же можно приклеить* (*МФ) = «Х-ом последующая ситуация, а именно приклеивание отломленной детали, рассматривается как потенциальная, т.е. возможная в какое-то время после момента речи. Значение возможности выражено предикативом *можно*». (Yes, it's me, but this can also be glued on (*МФ) = "X considers the subsequent situation, namely the gluing of a broken part as a potential situation, possible at some time after the moment of speech. The meaning is expressed by the predicative *can*").

3) presumptive (hypothetical) modality, for example: *Он, наверное, уже не придет*. = «Х предполагает, что Y после момента речи не придет, т.е. не совершит действия, выраженного глаголом в форме будущего времени». (He probably will not come. = "X supposes that Y will not come after the moment of speech, i.e. will not act with the verb expressed in the future tense").

4) incentive (imperative) modality, for example: *Не пори* (*МФ) *ерунды*. = «Х запрещает Y-у совершить действие после произнесения X-ом запрета, т.е. после момента речи». (Do not porridge (*МФ) nonsense. = "X forbids Y to act after his prohibition, i.e. after the moment of speech").

Тимочка, давай закроем (*МФ) *дверь, — ласково говорю я.* — В данном предложении содержится призыв X-а к Y-ку к совместному совершению действия после момента речи. Совместность выражена предикативом *давай*, будущее действие выражено глаголом в форме будущего времени 1 лица мн. числа *закроем*. (*Tima, let's close* (*МФ) *the door*, - I say gently. – in this sentence there is a call of X to Y to act together after the moment of speech. The jointness is expressed by the predicative *let*, the future action is expressed by the verb *close*, which shows the meaning of the future: *let us close*).

*Пусть Тamarочка посидит (*МФ) в зале.* — В данном примере X выражает просьбу *пусть посидит*, выраженную сочетанием предикатива и глагола в форме будущего времени. Значение просьбы является определяющим при соотносении со способом репрезентации, так как по формальному признаку — глагол БВ *посидит* — данный случай можно отнести и к морфологическому способу. (*Let Tamarochka sit (*MF) in the hall.* – In this sentence X shows the request *let sit*, expressed by the combination of a predicative and a verb denoting the future form. The meaning of the request is decisive in correlating to the way of representation, because according to a formal characteristic – the verb *sit* denoting future form – can also be related to a morphological way).

5) modality of intention (intentional modality), for example: *Тима, будешь (*МФ) мясо?* = «X обращается к Y-ку для определения намерений последнего, а именно *будет/не будет он (есть) мясо*, причем ситуация *будет/не будет иметь место* после момента речи». (Tima, will you have (*MF) some meat? = “X addresses to Y to know the latter’s intension, exactly, if he will/will not have meat the situation will/will not have place after the moment of speech”).

6) desirable (optional) modality, for example: *Одна дура Галина у нас на бывшей работе сказала: вот бы сумку (дура) из детских щек (*МФ), восторженная идиотка...* = «Объект речи Y высказывается о наличии желания иметь определенную вещь (сумка) в неопределенном будущем, когда-либо, вообще». (*A fool Galina in our former job said: here would be a bag (fool) of children's cheeks (*MF), an ecstatic idiot...* = “Speech object Y says about the wish to have a definite thing (a bag) in indefinite future, in general”).

The cases of representation of future semantics with such lexemes like next (week), later, tomorrow, etc. are related to lexical method. Students do not have difficulties with learning this method because of the “purity” of its exact lexeme – representatives, that is why we give some examples: *Это у меня навеки (*Л)!* (It's for me *forever (*L)!*). *Мы его увидели в семье, уже когда стукнуло восемь месяцев беременности, привела его моя страдальца, моя вечная боль (*Л), моя Алена.* (*We have seen him in the family when eight months of pregnancy had already came, my sufferer, my eternal pain (*L), my Alyena brought him.*)

Lexical – syntactic method expressed by various constructions is characterized by the heterogeneity of the composition, the core of which can constitute the units of different parts of speech with the meanings of forecasting, planning, expectation and others,:

- ✓ nouns, adverbs, adjectives (forecasting, prediction, risk, dream, etc);
- ✓ derivative verbs;
- ✓ constructions with causative verbs, predicative, etc.

Students’ attention should be focused on this method as it includes the signs of both lexical and syntactic methods. It is important to teach students to reveal integral and differential components in it. It is obvious that the integral component in lexical and lexical-syntactic method is the sema of the future, and the differential one is the fact that the core of the construction makes the set of units of lexical and syntactic levels, denoting the mental actions and states connecting with coming events.

Another problematic point is that the future semantics in such lexemes could often have an additional meaning and this situation causes difficulties in analysis. In this regard it is also necessary to focus students’ attention on differential signs of lexical – syntactic and syntactic methods, which are in the following:

- ✓ presence of lexical means with future semantics (or causative verbs) in lexical syntactic;
- ✓ absence of lexical markers of the future in the second case, i.e. syntactic method comprises only subordinate clauses of a complex sentence.

For example: 1) *Я купила на последние и пригласила очень милого слесаря вставить замок (*ЛС) в дверь моей комнаты.* — В данном предложении X-ом совершено ментальное действие, выраженное каузативным глаголом *пригласила*, данное действие имеет цель в отношении приглашенного «чтобы вставил замок», т.е. совершил действие после момента получения им приглашения». Как видно из примера, значение будущности имплицитно каузативным глаголом *пригласила*. (*I bought for the last and invited a very nice locksmith to insert a lock (*LS) in the door of my room.* – In this sentence X did a mental action, expressed by causative verb *invited*. This action has the aim related to an invited person “to insert a lock”, i.e. acted after receiving an invitation” as it is shown in the example, the meaning of the future is implicit with causative verb *invited*).

2) *Глупец, он не подозревал, что я уже взрослая и даже готовлюсь стать бабкой! (*ЛС)* = «X описывает свое настоящее, выраженное глаголом в настоящем времени *готовлюсь*, в семантике которого заключено значение «делать приготовления к чему-нибудь». В данном случае X *готовится* к тому, чтобы *стать бабкой*, а именно готовится к выполнению социальной роли, которая возможна только при наличии определенных условий, то есть при наличии внука (внучки), что еще в жизни X-а не произошло, но предстоит произойти. (*Poor him, he didn't suspect that I was already a grown-up and even getting ready to become a grandmother! (*LC)* = “X describes her present state, expressed by the verb in the

present tense *getting ready*, the semantic of which has the meaning of “to make preparations for something”. In this situation X is getting ready *to become a grandmother*, exactly is getting ready to fulfill the social function which is possible only under the certain conditions, i.e. conditions of having a granddaughter (grandson), whom she doesn't have now, but she will have).

3) *Теперь из этих тогда приобретенных лоскутов я все намереваюсь что-то сшить (*ЛС) Тиме, но рубашечку я не осилю (*М).* = «X декларирует свое намерение осуществить определенное действие (*сшить*), которое предполагает произвести в какой-либо отрезок времени после момента речи». Семантика будущего заключено в слове *намерение*, которое имеет значение «осознанная цель, решимость, смысл желания или действия; неотъемлемое всепоглощающее ожидание четко сформулированного события с полным отсутствием сомнений в его необходимости». (*Now, out of those then acquired flaps, I still intend to sew something (*LS) to Tim, but I cannot cope with the shirt (*M).* = “X declares her intention to do a definite action (*sew*), which she supposes to do at some definite time after the moment of speech”. The future semantics is in the word “*intention*” with the meaning of “conscious aim, decision, meaning of desire or action; inalienable all-consuming expectation of clearly formulated event with the full absence of doubt in its necessity”).

Syntactic method is expressed by circumstantial – temporal subordinate clauses, and mainly by subordinate clauses of purpose and condition, where the meaning of future actions is more expressed. For example: *Он меня накрыл как на фронте своим телом от опасности, чтобы меня никто не увидел (*С).* В данном примере придаточное предложение цели относится ко всему главному предложению и соотносится с будущей ситуацией «*чтобы никто не увидел*». (He covered me with his body from danger as at the front, *so that no one would see me (*C).* In this sentence the subordinate clause of purpose is related to the main sentence and is correlated with the future situation “*so that no one would see*”).

*Он не знает, что я ничего не получаю, а ежели бы узнал (*С), ежели бы узнал...* Данный пример также иллюстрирует наличие ситуации в будущем (=если узнает), которое выражено условным придаточным предложением. (*He does not know that I do not get anything, but if he knows (*C), if he knows...* This example also illustrates the situation in the future (= if he knows), which is expressed by the conditional subordinate clause).

The non-verbal method is expressed by the non-verbal syntactic constructions with the future tense meaning correlated with constructions including the form like *will be*. For example: *Але-на! Иди сюда. — У меня экзамен (*БГ), мам. — В данном примере семантика будущего выражена эллипсисом глагола будет (предстоит).* (Alye-na! Come here. – I have an exam (*БГ), mother. – In this example the semantic of the future is expressed by the ellipsis of the verb *have*).

In *contextual way* of the future meaning representation the semantics of the future tense exists implicitly, it is implicated by other meanings. The transposition of the tense form we relate to this way; the presence of the future meaning expressed by means of word formation, etc. For example: *В результате веду его в ванную умываться (*К) ослабевшего от слез, истерика в чужом доме!* В данном предложении семантика будущего имплицитно выражается инфинитивом *умываться*, выступающим целью предыдущего действия (*веду*)= «веду для того, чтобы умыть Y», т.е. совершить действие, отдаленное от действия *веду*, определенным промежутком времени. Как видно из примера, значение будущего формальных показателей не имеет, а вытекает из контекста. (*As a result, I lead him to the bathroom to wash (*K) weak with tears, hysterics in a stranger's house!* In this sentence the semantics of the future is implicit with the infinitive *to wash* which shows the purpose of the previous action (*lead*) = “lead Y to wash”, i.e. to do an action separated from the action of *lead* by definite period of time. The example demonstrates that the future meaning does not have any formal signs but it is clear from the context).

*Все, больше нам сюда дороги нет (*К), этот дом я держала про большой запас, на совсем уже крайний случай.* Данный пример содержит выражение «*больше дороги нет*», которое можно переформулировать как «в будущем сюда нельзя будет вернуться», т.е., как видим, значение будущего в безглагольной конструкции выражено имплицитно. (*That all, there is no road for us here anymore (*K), I kept this house for a big stock, for the case of least emergency.* There is such an expression in this example as “no road any more” which can be paraphrased as “we cannot come back here in the future”, i.e. as we see the future meaning is expressed implicitly in non-verbal construction).

These theoretical commentaries will contribute to the conscious fulfillment of the following tasks by students, directed to the formation of skills of eliciting the ways of expressing the future meaning and semantic analysis of the representatives units in combination with illustrational materials.

Structural classification of language units

At this stage of analysis the students must learn to correlate the elicited constructions of future meaning with one of the methods of representation of the future semantics, given in table 1, which contains not only the correlation of theoretical FSF structure of the future with the practically identified ways of expressing the future meaning, but also the related texts coding and analysis category. To conduct a structural classification of language units analysis in the context we highlight in a specific colour each way of representation of the future semantics: for example, lexical – in orange, morphological – in red, lexical – syntactical – in blue, elliptical – in grey (see table 1). In front of each method we specify a symbol, for example: (*L) – lexical, (*M) – morphological, (*LS) – lexical – syntactical, (*C) – contextual, (*MF) – modal – future, (*E) – elliptical. Further we pass to the following step of our algorithm.

Determining the account units

In conducting analysis we admit the constructions or lexemes found in artistic text, representing the future semantics, as an account unit. We notice that homogeneous parts of the sentence, expressing by one way of representation, are considered as one account unit. The cases of using different methods of representation within one sentence are considered depending on heterogeneity of means of expression. For example:

Не плачь, я на тебя выйду (*M), пиши мне до востребования, я всегда там получаю, ты меня не теряй (*MF). (Don't cry I'll go out on you (*M), write to me on demand, I always receive there, don't lose me (*MF).

As the markers show homogeneous parts of the sentence *не плачь, пиши, не теряй* (*don't cry, write, don't lose*) are expressed by the verb in imperative mood are considered as one case of modal – future method, while the verb in the future tense *выйду* (*will go out*) is the separate case of representation of the morphological method.

Table 1

The structure of the future according to A.V.Bondarko (from the center to periphery)	Means of expressing the future semantic	Method of of representation the future semantics	Coding
Perfect and imperfective verbs (simple, complex, future)	Perfect and non-perfective verbs in future tense, imperfect verbs + infinitive, combination of auxiliary verb + past participle	Morphological	M
Syntactic constructions with modal meanings	Constructions with modal meaning, which suppose the future plan: incentive (imperative), conditional constructions (subjunctive mood), constructions of desirability, obligation, possibility (potentiality), necessity	Modal - future	MF
Non-verbal syntactic constructions	Non-verbal constructions with the future tense meaning correlating to constructions denoting the form of <i>will</i>	Elliptical	E
Lexical circumstantial indicators	Lexemes with temporal meaning like next week, next year, later, etc.	Lexical	L
Constructions with conjunctions	Circumstantial – temporal subordinate clauses of purpose and condition	Syntactic	S
✓	Constructions, consisting of words with forecasting, planning, expectation meanings – with nouns, adverbs, adjectives (forecast, prediction, risk, etc.) + verb; constructions with derivative verbs; constructions with causative verbs, predicative, etc.	Lexical – syntactic	L S
Contextual means of transforming the temporal relations, which do not have some definite and homogeneous structural feature.	Future semantics is implicit. For example, in constructions with transposition of tense forms; in lexemes with secondary meaning of essence, conditioned with the means of word formation.	Contextual	C

As the table shows, there is a small non-coincidence between theoretical structure of FSF of future and those representation methods which have been identified in the process of text analysis. Thus, we allocated the lexical – syntactic method, which according to A.V./Bondarko's theory is absent in the structure of FSF of the future, on the basis of consolidation of lexical and syntactical units in one unity, while constructions with conjunctions in such sentences do not relate to the whole sentence but to one word denoting mental actions and states in the future. Consequently, we relate all constructions with subordinate clauses of purpose and condition to the syntactic method. It is important to note that we isolate the structure of FSF of the future from the FSF of the temporary which has been described in A.V.Bondarko's theory of functional grammar in details. We isolate the future field from the general field of time on the basis of the fact that the temporary field is a hyperonym towards the field of the future.

FINDINGS

Quantitative characteristics

Further in the instruction "To find" in "Search" line we write the language units codes and get the quantitative characteristics on each method of representation of the future semantics. For example: we enter the code of morphological method of representation - *M in the search line, then the number of this marker which is met in the text, lights up. However, such way of counting the number of suggested methods is convenient only in working with electronic version of artistic work. While working with the printed variant it is necessary to make a table, where all sentences (or the part of them, where one of the methods of representation is visually demonstrated) met in the text are being written with codes. (see below)

Table 2

Method of representation	Sentence (or its part), having in composition the representative of the future semantics	Coding	Note
Morphological	...I report, that you get alimony from Timka's father	*M	
	... I go on foot/	*M	
Modal - future	Go up the stairs, call the lift...	*MF	Homogeneous parts of sentence are as one case

As we worked with electronic version of the text we continue counting with further process of filling the table. We fill the table with quantitative characteristics and percentage of each method in the order of its decrease (see Table 3).

Table 3

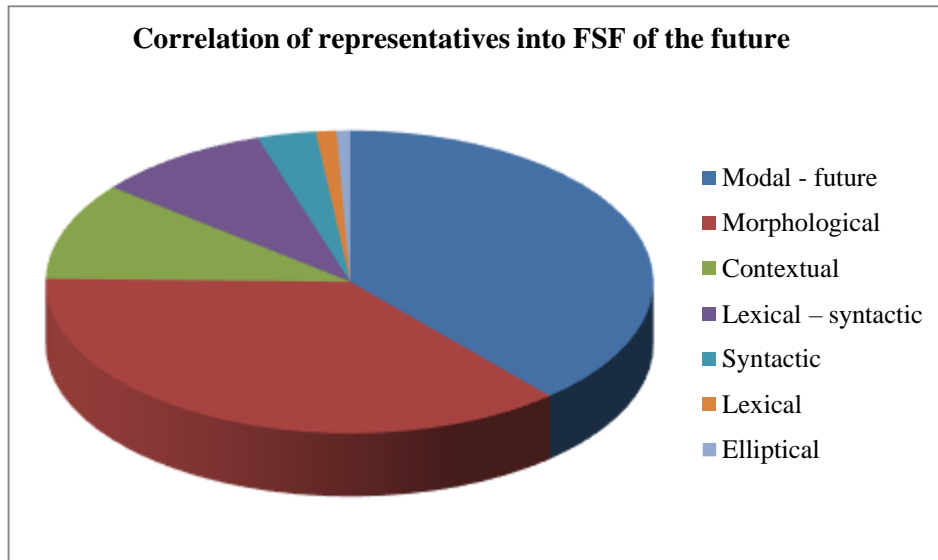
Method of representation the future semantics	Quantity	%
Modal - future	211	38,5
Morphological	201	36,5
Contextual	57	10,5
Lexical-syntactic	51	9,3
Syntactic	17	3
Lexical	6	1,1
Elliptical	4	0,7
Total	547	100%

The fulfillment of this stage of algorithm develops the skills of effective use of computer technologies in semantic analysis of language units.

Construction of graphic data (tables, diagrams)

The quantitative characteristics got at the previous stage we round to the full number and transform it to the diagram with the help of Excel programme (see Picture 1. Correlation of representatives into FSF of the future).

Picture 1



INTERPRETATION

As quantitative data show future semantics mainly represents by modal – future method (38.5%) in an analyzed text. This is explained by the variety of modality, correlating to future plan as well as by the abundance of imperative sentences in an analyzed text. Besides, the peculiarity of modal verbs is the ability to express the inner state of a character, which should be described fully in diary entry which is the story under analysis.

According to the frequency of usage in the text on the second place is the morphological method, and besides the difference in the number of representatives is only 2%. Indicative is that the analyzed text is a diary entry; consequently, the past tense form is mainly used in the text. The fact of functioning of great number of grammatical forms of past tenses in the text confirms our hypothesis about the FSF of the future which represents the field with predicative core.

Constant use of contextual method is also observed in an analyzed text – 10.5% of general number of representatives that promotes its position to the center according to the results of analysis of the given text. We note the non-typical character of such closeness of implicitly expressed future meaning to the core of FSF of the future which is confirmed with our previous study, where the contextual method of representation was far from the center of the field taking one of the last places on quantitative characteristics. Different number of functioning means of contextual method in various texts confirms the correctness of the sample, as further summing up of all representation methods will allow make objective conclusions on the structure of FSF of future on post modernistic texts.

Lexical-syntactic method takes the fourth place on the number of representatives, identified during the analysis, which is 3 times more than the number of representatives of syntactic method and 9 times more than lexical method. Such picture witnesses that integrative constructions used in building a text as well as lexical-syntactical method, is characterized by rather regular functioning because of great possibilities of expressing meanings.

The other 5% of general number of representatives are related to syntactic, lexical and elliptical methods from which we can conclude that in describing future situations the preference is given to the constructions of grammatical character where there are different verb forms as a material representative of the future semantics.

CONCLUSIONS

1. Nowadays, training of the future linguists must be carried out on scientific dominant of philological sciences of the XXI century within the anthropological scientific paradigm which supposes to study the mechanisms of a person's cognition of conceptual picture of the world. This situation actualizes an address to the plan of realia content of an environment, called language units.
2. An address to the contextual side of language units causes the necessity of formation in students the skills of semantic analysis of texts of any typology, including artistic texts.
3. Teaching students the methods of semantic analysis must be carried out on the material of definite artistic texts

4. Within this article we suggested the algorithm of semantic analysis of an artistic text - content – analysis – with further description of each stage.
5. As a result of using the content – analysis the students form the skills of:
 - ✓ eliciting and describing all possible representatives of future meaning in an artistic text – analysis units, language (linguistic) units;
 - ✓ determining the frequency of using the representatives, which are the constituents of the future field – account analysis, quantitative measure of analysis;
 - ✓ distributing the field constituents to the center and periphery on the basis of language units frequency in the text and the formation of FSF structure.

REFERENCES

- Berelson, B. (1952). *Content Analysis in Communication Research*. New York.
- Levitskii V.V. (2007) Quantitative methods in linguistics. Nova book. Vinnitsa.
- Manaev O.T. (2010) Content – analysis as a research method. Electronic resource. Access regime: <<http://www.psyfactor.org/lib/content-analysis3.htm>>, дата доступа: 07.06.2017.
- Manekin R.V. Content – analysis as a method of historical research. R.V. Manekin \ Klio. International scientific –historical journal of Donetsk department of Soviet association of Young Historians and the Agency of “Informservice” -1991. - №2. – С. 30-36.
- Markoff S., Shapiro G., Weitman S. (1974). Toward the Integration of Content Analysis and General Methodology. Sociological Methodology. Ed. D. Heise. San-Francisco, Jossey-Bass.
- Sidortsev V.N. Methodology of history: quantitative methods and information technologies. Minsk; BSU.
- Lande D.V. Theory of informational search. Kiev. Electronic resource. Access regime: <<http://av.disus.ru/metodichka/1988804-1-lande-dmitriy-vladimirovich-teoriya-informacionnogo-poiska-metodicheskoe-posobie-dlya-studentov-kafedri-kompyuternih-nauk-kratkoe-soder.php>>, access data: 07.06.2017.
- Petrushevskaya L. (2001) Time night. – Vagrius.

Types of Behavior in Businesses and Resistance to Individual Change

Okan ŞENELDİR

*Kocaeli Üniversitesi Kocaeli Meslek Yüksekokulu
seneldir@gmail.com*

Mustafa KUDU

*Erzincan Üniversitesi Fen Edebiyat Fakültesi
mustafakd3@yahoo.com*

Yaşar GENEL

*Yüzüncü Yıl Üniversitesi Eğitim Fakültesi
yasargnl6@yahoo.com*

Üzeyir AKÇA

*Kocaeli Üniversitesi Kocaeli Meslek Yüksekokulu
uzeyirkc3@yahoo.com*

Hüseyin SOYDAŞ

*Kocaeli Üniversitesi Kocaeli Meslek Yüksekokulu
huseyinsyds3@yahoo.com*

Sinan AYDIN

*Kocaeli Üniversitesi Kocaeli Meslek Yüksekokulu
Corresponding author
Tel: +90 507 261 6572
sinanaydin1704@yahoo.com*

ABSTRACT

In businesses, shyness, aggressiveness and assertiveness are important types of behavior. Shyness is to be overly sensitive to being negatively assessed by others. Aggression is to be insensitive to the rights and feelings of others. The aggressor violates the rights of other individuals by improper means. Assertiveness makes it possible for us to exercise our rights without violating the rights of others. The assertive behavior is the type of behavior most desired. Change takes place through learning. Individual change begins with awareness. But even positive changes create stress. It is necessary to struggle with the resistance within us to change habits. Both shy and aggressive behavior are incompatible behaviors. For this reason, these two behaviors must be the aim of the business management to turn into the assertive behavior. Employees with incompatible behavior show resistance to change. For this reason, business management should facilitate individual change of employees.

INTRODUCTION

Individuals are behaving in three ways while communicating. These; aggressiveness, shyness and assertiveness. In businesses, shyness, aggressiveness and assertiveness are important types of behavior: Shyness is to be overly sensitive to being negatively assessed by others. Aggression is to be insensitive to the rights and feelings of others. The aggressor violates the rights of other individuals by improper means. Assertiveness makes it possible for us to exercise our rights without violating the rights of others. The assertive behavior is the type of behavior most desired.

Galassi and Bastien (1974) emphasized the multidimensional nature of assertiveness by defining it in terms of three response classes, which include positive assertiveness, negative assertiveness, and self-denial. Positive assertiveness is said to consist of the expression of positive feelings such as agreement, affection, and admiration. Negative assertiveness, on the other hand, is defined as the expression of negative feelings such as anger, annoyance, and disagreement. Self-denial includes excessive interpersonal anxiety, unnecessary apologizing, and exaggerated worry about the feelings of others.

Shyness is the fear of interacting with other people, a natural state of mind among many people. Fear is an emotion which is mostly triggered by the release of hormones or neurotransmitters like adrenaline and noradrenaline. The reason fear exists is mainly evolutionary for self-preservation. Feeling scared in dangerous situations keeps you alive. Social anxiety is a commonly occurring phenomenon in our postmodern society. The pathological shyness discourages many people from showing their whole potential in front of other people in school, at work or in general social situations. People who are shy often also have difficulty in being assertive. This is often a source of serious distress. Being unassertive can sometimes lead to further anxiety and even depression. Wolpe (1968) argued that shy individuals often experience inhibitory anxiety that prevents them from responding assertively. Cognitively, lack of assertiveness can be influenced by self-depreciation (Rich & Schroeder, 1976). Individuals with a low sense of worth may experience difficulty in standing up for themselves because they view others' thoughts, feelings, and rights as more important than their own. The cognitive interpretations of social situations are guided by core beliefs, which are developed from childhood experiences with attachment figures and influence how we view our self, others, and the relationships between them. Individuals who fail to speak up for themselves may easily be ignored or disrespected by others, which may lead to depression and a higher susceptibility to stress. Self-Expression Scale indicated that non-assertive individuals tend to experience excessive interpersonal anxiety, feelings of inferiority, and engage in negative self-evaluation.

Lefevre and West (1981) also found an inverse relationship between assertiveness and fear of disapproval. Watson and Friend (1969) defined fear of negative evaluation as one cause of social anxiety, which involves apprehension about being negatively evaluated by others in any social context that calls for judgment. Individuals with high levels of fear of disapproval expect to be negatively evaluated by others and therefore tend to avoid evaluative situations. The proposition that failure to assert oneself is connected to certain affective personality variables, such as social anxiety, was further supported by Orenstein, and Carr (1975). Their correlational study showed that assertiveness is inversely related to interpersonal anxiety. Individuals with high social anxiety may fail to assert themselves in social contexts due to their fear of doing or saying the wrong thing. Accordingly, it was hypothesized for the current study that students' level of assertiveness would correlate negatively with their levels of social anxiety or more specifically, fear of disapproval. The fact that assertive students reported higher self-esteem and lower fear of disapproval than nonassertive students, lends further support to the view that non-assertive response patterns are influenced by interplay of certain covert cognitions and emotions.

Assertive individuals are capable of acting in their own best interest without experiencing excessive anxiety or disregarding the rights of others. Assertiveness was a subdimension of dominance which was subsumed under extraversion, and extraversion became part of the well accepted personality trait measurement known as the "Big Five" factor for studying individual differences and used extensively in the leadership research. A meta-analysis on the "Big Five" personality dimensions found that extraversion (traits such as: sociable, gregarious, talkative, assertive, and active) was predictive of job performance, but only for certain occupations that involved social interactions such as: managers and sales (Barrick & Mount, 1991).

Assertiveness is a learned fundamental interpersonal communication skill that helps individuals to meet the social demands of society. Being a sub-dimension of other constructs like extraversion and dominance, assertiveness is often regarded as a personality trait and not as behavior in the leadership literature, although researchers have argued that personality traits can manifest into behaviors given the right situations (House & Aditya, 1997). Because leadership is the ability to accomplish goals by exerting influence over others. Much of the clinical research defines assertiveness in terms of being able to stand up for one's rights and gained momentum with the civil rights movement and women's rights.

CHANGE

Change is, under certain circumstances, a transition from one state to another. Change is the transformation of any system from one state to another (İleri & Güven, 2003, 88). It is inevitable and an organization has to manage change. Businesses are now operating in a rapidly changing markets and conditions. Pressure from competitors and various external changes is forcing businesses to respond to change and make changes to their existing operations.

All changes depend on people. Mentioned change is mental change. The desire for change must first begin within the person himself. Internal motivation is essential for change. Change is a continuous process before anything else. Individual change is a plan to change himself/herself through learning. Vision is required for individual change. You may want to change one or more of your Life Space boundaries. It depends on your vision, which boundaries you want to stretch and expand.

RESISTANCE

A known fact is that change creates resistance. Fear of the unknown, habit, inertia, lack of trust, fear of failure, incomplete training, business status hazard, business security hazard, uncertainty is some of the sources of individual resistance to change.

Timing, surprise, peer pressure, self-interest, misunderstanding, different assessment, threat to established resource allocations, structural inertia, limited focus of change, group inertia, threat to expertise, threat to established power relationships are some of the sources of organizational resistance to change. Inertia is the tendency to remain unchanged. The old way of doing things is comfortable and easy, so people do not want to change or try something new. Poor timing may cause resistance. When employees and managers are in bad relations, the time to introduce change is not fit. Resistance may occur when the change is unexpected surprise or sudden for employees. Individuals may resist a change when the team resists. Individuals may resist a change if they feel it will cause them to lose something. Employees may resist a change because they do not fully understand its purpose or benefits even if it will benefit them. Employees and management may see the change and its advantages in a different way. Management may see the change as increased efficiency while employees may see only the costs of it.

DEAL WITH RESISTANCE TO CHANGE

Education, communication, participation, involvement, facilitation, negotiation and rewards, simplification, guidance, force, discussion and financial support, forcing and coercion are some solutions against resistance to change. Extraversion, dominance, aggressiveness and pro-social influence facilitate individual change.

The first study on change models was carried out by Kurt Lewin. According to Lewin, change takes place through processes of unfreezing, change and refreezing (Çankır, 2017, 116). Basic stages of implementing resistance to change as follows:

Stage one: Unfreezing: Breaking from the old ways of doing things, unfreezing the old organizational culture by communication.

Stage two: Moving: Instituting or establishing the change, establishing a vision for change direction, and directing people to the change.

Stage three: Refreezing: Reinforcing and supporting the new ways, strengthening and supporting the change by providing new control and rewarding systems.

ASSERTIVENESS AND CHANGE

As an interpersonal trait, assertiveness has had a long history in the psychology and management research. In the 70s, when the civil rights movement in the U.S.A. was rising, a number of psychologists paid attention to assertiveness as a means of protecting individual rights. Alberti and Emmons (2008), Jakubowski and Lange (1978), and Smith (1985) emphasized that the ability to protect own human rights in a humane and democratic way, without prejudice to the fundamental rights of others, was among the important characteristics of assertive conduct. Being assertive means being able to express your own needs while at the same time acknowledging the needs of others (Rapee, 1998, 98). Assertiveness, which is the recommended form of behavior for an effective and healthy communication, was first described by Wolpe and Lazarus (1966). In English "assertiveness" is used as a counterpart of the concept. (Uzuntarla, 2016, 98). In relation to the motive to influence, assertiveness is "needed to direct group activities and advocate for desired changes to the organization" (Hoffman et al., 2011, p. 351). Assertiveness is like a dish with too much or too little salt: too much salt and the taste is ruined, too little salt and the dish lacks flavor, just the right amount of salt and the flavor of the dish is enhanced. A study by Lefevre and West (1981) found a significant positive correlation between assertiveness and level of self-esteem in undergraduate students.

Assertiveness is positively associated with extroversion. Extraversion has played a major role in the study of what makes leaders effective. Generally, assertiveness in the management and psychology research is a key characteristic of extraversion. Extraversion is usually defined as being ambitious, sociable, and having the tendency to experience positive emotions such as joy and pleasure (Lazenby, 2015). It incorporates characteristics such as being active, energetic, upbeat, talkative and optimistic, and is viewed as a main dimension of the trait paradigm in the personality research on leadership. A study by Bouchard, Lalonde and Gagnon (1988) explored correlations between assertiveness and personality factors in undergraduate students, which revealed a significant positive correlation between overall assertiveness and extraversion. Extraverted individuals are said to be more talkative and comfortable around people than are introverted individuals.

Assertiveness increases self-efficacy and decreases perfectionism. Self-efficacy also facilitates change. It is a key for the relationship between man and others and is a method for proper and correct self-expression. Some persons don't learn assertive behaviors and don't have "say no" power, and can't interact with the others in an assertive method, the reason is resulted from the family and their characteristics. These persons feel guilty and non-confident in their social relationship with the others and express fear, anxiety and depression in their behavior (Pirooz, 2014, 14). Bardon, Cone, Abramson, Hiterton and joins (2006) in an investigation studied the relationship between idealism and self-efficiency in a sample comprising of 406 females' studies showed that there is a negative correlation between induced social idealism and self-efficiency. Most people like doing their tasks perfectly and if they commit a small mistake, they will be disappointed, leave their work and start criticism and negative evaluation about themselves. Today, there are many obstacles toward normal psychological processes of the person which can create some problems in the trend of their development. Idealism can be considered as one of these obstacles. As a psychological concept, idealism is actually a personality structure. The results of a research by Pirooz's show that there is a negative and significant relationship between assertiveness and parent's idealism. Based on the findings, the relationship between assertiveness of the students and parent's idealism was negative and significant.

Individuals with positive core beliefs about the relationships (e.g., "In my relationships with others I don't let them dominate me and also don't try to dominate them") may find it easier to assert themselves than individuals with negative core beliefs (Kirst, 2011, 7). According to Lange and Jakubowski (1976), people high in assertiveness are more self-actualized than people low in assertiveness because assertive behavior leads to one's needs being respected and fulfilled. Individuals high in openness to experience tend to have a wide range of interests and welcome new experiences.

CONCLUSION

Avoidance and aggressive behaviors lead to disconnections in communication. The concept of aggression has been described in many sources as "any kind of disturbing and irritating behavior towards objects. Change takes place through learning. Individual change begins with awareness. But even positive changes create stress. It is necessary to struggle with the resistance within us to change habits. Both shy and aggressive behavior are incompatible behaviors. For this reason, these two behaviors must be the aim of the business management to turn into easygoer behavior. Employees with incompatible behavior show resistance to change. For this reason, business management should facilitate individual change of employees. Communication is vital in the process of change, as it often help balance the mixed feelings staff may have. Through communication, the management of organizations gain support from staff to participate in the process of change. If change is not communicated to all the parties involved and affected it will be regarded as a one-sided process and staff may become resistant to it.

Resistance to change decreases if assertiveness increases. Dominance, extraversion and leadership are related to assertiveness. Dominance, a motivation toward achieving positions of power, status, and control, arguably entailing a willingness to be interpersonally assertive. Extraversion, associated with verbal assertiveness, has been linked with leadership as well. Assertiveness has received extensive attention in research literature and has become a desirable goal of therapy due to its link to healthy personality adjustment in Western cultures. Although research literature to date proposes numerous definitions, assertiveness generally has been conceptualized as standing up for one's personal rights and communicating thoughts, feelings, and beliefs in a sincere, straightforward, and appropriate manner without violating others' rights. Assertive behavior is commonly associated with the ability to initiate and maintain rewarding interpersonal relationships in the business world and personal life. As a result, assertiveness is related to communication and leadership. Therefore, resistance to change is reduced by assertiveness.

REFERENCES

- ALBERTI, R. E., & EMMONS, M. L. (2008). *Your perfect right: Assertiveness and equality in your life and relationships* (9th ed.). Atascadero, CA: Impact Publishers.
- BARDONE-CONE A.M, ABRAMSON L.Y, HEATHERTON T.F. & JOINER T.E. (2006). Perfectionism, Self-Efficacy in Women, Department of Psychological Sciences, University of Missouri- Colombia.
- BARRICK, M. R., & MOUNT, M. K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44(1), 1-26.
- ÇANKIR, B. 2017. The Effect of Self Efficacy and Resistance to Change on Entrepreneurship Tendency. *International Journal of Economic Studies*, 3(2), 115-124.
- GALASSI, M. D., & BASTIEN, S. (1974). The College Self-Expression Scale: A measure of assertiveness. *Behavior Therapy*, 5(2), 165-171.
- HOUSE, R. J., & ADITYA, R. N. (1997). The social scientific study of leadership: quo vadis? *Journal of Management*, 23(3), 409.
- ILERI, H. GUVEN, Y. 2003. Değişim Yönetimi ve Değişime Direnç. *S.Ü. Sosyal Bilimler Meslek Yüksekokulu Dergisi*, 6(1), 87-106.
- JAKUBOWSKI, P., & LANGE, A. (1978). *The assertive option: Your rights and responsibilities*. Champaign, Illinois: Research Press.
- KIRST, L. K. (2011). *Investigating the Relationship Between Assertiveness and Personality Characteristics*. A thesis in the College of Sciences and in The Burnett Honors College at the University of Central Florida, Orlando, Florida, 6-7.
- LAZENBY, C. L. (2015). *Assertiveness and Leadership Perceptions: The Role of Gender and Leader-Member Exchange*. A Thesis Master of Science in Management, Faculty of Management University of Lethbridge, Alberta, Canada.
- LEFEVRE, E. R., & WEST, M. L. (1981). Assertiveness: Correlations with self-esteem locus of control, interpersonal anxiety, fear of disapproval, and depression. *Psychiatric Journal of the University of Ottawa*, 6(4), 247-251.
- ORENSTEIN, E., & CARR, J. E. (1975). Assertiveness and anxiety: A correlational study. *Journal of Behavior Therapy and Experimental Psychiatry*, 6(3), 203-207.

- PIROOZ, M. (2015). Multiple Relationships between Self-esteem, Assertiveness and Self Efficacy Among Female Students with Parents Perfectionism in Shahrekord Guidance Schools. *Advanced Social Humanities and Management*, 2(4), 14-19.
- RAPEE, R. M., 1998. *Overcoming Shyness and Social Phobia: A Step-by-Step Guide*. Jason Aronson, Inc. p.98.
- UZUNTARLA, Y., CİHANGİROĞLU, N., CEYHAN, S., UĞRAK, U. (2016). Analysis of University Students' Assertiveness Level. *TAF Preventive Medicine Bulletin*. 15(2), 98-104.
- RICH, A. R., & SCHROEDER, H. E. (1976). Research issues in assertiveness training. *Psychological Bulletin*, 83(6), 1081-1096.
- WATSON, D., & FRIEND, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology*, 33(4), 448-457.
- WOLPE, J., LAZARUS, A.A. (1966). *Behavior Therapy Techniques*. Pergamon Press, Elmsford, NY.,
- WOLPE, J. (1968). Psychotherapy by reciprocal inhibition. *Conditional Reflex*, 3(4), 234-240.

Using Electronic Information Resources Centers by Faculty Members at University Education: Competencies, Needs and Challenges

Abouelenein

*Department of Educational Technology, Damietta University,
Egypt
yousriabouelenein@gmail.com*

Yousri Attia MOHAMED

*Prince Sattam bin Abdul Aziz University,
Saudi Arabia
yosreyam@du.edu.eg*

ABSTRACT

This study aimed at investigating the factual situation of electronic information resources centers to faculty members at university education. Competencies that faculty members should possess regarding this issue were determined. Also their needs for (scientific research skills and teaching) were assessed. In addition, problems that hinder their use of electronic resources centers were identified. Data obtained were analyzed statistically using SPSS in measuring reliability of instruments. Participants of the study were (655) faculty members at Saudi Universities (412 males & 243 females). Results indicated that there were significant differences between male and female at ($\alpha \leq 0.05$) level. Results also revealed significant differences between members of different ranks at ($\alpha \leq 0.05$) level, and between academic areas of specializations at ($\alpha \leq 0.05$) level. Significant differences were also found between faculty members in terms of years of experience in using electronic information resources centers at ($\alpha \leq 0.05$) level. This study recommends that most Saudi Universities are in need of establishing electronic information resources centers and offering training courses to provide technical support in a way to solve some of faculty members' problems.

Keywords: electronic information resources; faculty members; competencies; needs; challenges.

INTRODUCTION

Quality of education offered to students is the success key of any educational institution. Since every student need to be provided by ways to facilitate the essential responses for learning, the educational environment should consist of knowledge, competencies, abilities, motives, teaching methods etc. These aspects are related and greatly affect the whole environment. Thus, the use of electronic information resources centers is a high level individual activity initially assures the provision of many of faculty members needs at universities and help them achieve their competencies.

Surveying the educational developments shows that a number of policies are set to maintain that educationalists need to get along with innovations in the field (Fahad et al. 2013). However electronic information resources centers witnessed many changes until reaching the current level, making development of these centers a continuous process. The history of these centers goes back to classroom library then universities libraries that were developed to include media and non-printed materials where they used to be called comprehensive libraries. Finally, the electronic information resources centers that include all resources and the focus they make to the learning process rather than the teaching process.

Electronic resources centers are characterized by the electronic material they contain which allows access to the biggest possible number of periodicals, reports and statistics in academic fields. They also allow continuous updating to these materials (Hughes 2013). Searching electronic information centers is much easier for faculty members as they enable them to be in continuous contact with the international databases around the world.

Thus, these centers offer a service that facilitates gaining information in a few moments unlike traditional methods that used to take weeks and in some cases months (Hostager 2014). Not only in terms of time, these centers facilitate the direct access to the materials by printing, downloading or sending them by email. Electronic information resources centers offer a big number of digital information for their users quicker than doing this manually through printed materials (Andrews and Eade 2013).

Furthermore, electronic searches help discovery of some information that could not be obtained through traditional methods. The field of scientific research makes good use of these electronic ways as they help facilitate continuous communication among researchers and gain updating to new discoveries (Taffs and Holt 2013). Also, the use of electronic information resources centers improves many learning and teaching processes in addition to extra curricula activities.

Currently educational processes face many problems and challenges due to the so many continuous and competitive developments we witness today. These led to the need of establishing electronic information resources centers to help educationalists get along with new developments. Use of these centers help improve teaching and learning processes in a way to prepare a generation able to face challenges, find solutions using scientific ways based on new and multiple resources. More important, these centers offer better ways of how to employ educational technology effectively to achieve educational goals as they consider learners to be participants unlike traditional methods that consider them only receivers (Davids et al. 2014).

The current study considers investigating the use of electronic information centers in universities and institutions of higher education and finding solutions to problems that may suffer as prerequisites for distinction in all fields of knowledge. The study investigates also the way faculty members use electronic information centers in conducting scientific research and in their teaching. In addition to the identification of problems that may hinder their effective use of these centers and their needs for better practice. These are for the purpose of developing a framework for helping the faculty members to obtain competencies that maintain their effective use of these centers. This framework will offer electronic educational environment that allow opportunities for practicing self-learning skills and reinforcing research and discovery skills that help faculty members to employ modern ways in designing, developing, implementing and evaluating the courses they teach (Akaichi 2014).

This study seems important in helping faculty members in identifying competencies they need to possess in order to effectively use electronic information resources centers. It will help also identifying types of electronic information resources centers that could be of benefit to the educational process. The current study tries to orient those in charge of Saudi universities towards the importance of establishing electronic information centers in terms of faculty member's needs. This study will provide those in charge of electronic information resources centers with challenges that hinder the use of electronic information resources centers (Solomou et al. 2015).

The current study matches the contemporary focus all over the world on the use of electronic information resources centers in universities and all educational institutions. The study tries to identify the way faculty members use these centers at Saudi Universities in conducting their scientific research and in their teaching. The study identifies types of electronic information resources that help faculty members to practice self-learning skills that support research and discovery skills.

Given the important role electronic information resources centers play in improving the work of faculty members (Wang 2014), this study asks the following main research question:

What is the factual situation of the use of faculty members at Saudi universities to electronic information resources centers?

This entails a number of sub-questions that can be summarized as follows:

- 1- What are the competencies faculty members at Saudi universities should possess in order to be able to use electronic information resources centers?
- 2- What are the needs of faculty members to use electronic information resources centers for?
- 3- What are the challenges that hinder faculty members at Saudi university from using electronic information resources centers?

Hypotheses of the study

- 1- There are significant differences at ($\alpha \leq 0.05$) level regarding the use of faculty members at Saudi universities to electronic information resources centers in terms of gender.
- 2- There are significant differences at ($\alpha \leq 0.05$) level regarding the use of faculty members at Saudi universities to electronic information resources centers in terms of academic rank.
- 3- There are significant differences at ($\alpha \leq 0.05$) level regarding the use of faculty members at Saudi universities to electronic information resources centers in terms of academic area of specialization.
- 4- There are significant differences at ($\alpha \leq 0.05$) level regarding the use of faculty members at Saudi universities to electronic information resources centers in terms of number of years of experience.

Aims of the study

- 1- Identifying competencies faculty members should possess in order to be able to use electronic information resources centers.
- 2- Identifying how far faculty members' needs are fulfilled regarding the use of electronic information resources centers.
- 3- Identifying the challenges that might hinder the use of faculty members in these centers.

Review of literature

Electronic information resources centers enable faculty members to use multiple resources at the appropriate environment provided by the university. The use of these centers helps faculty members to better attracting students' attention and increasing their interest during learning (Yessad et al. 2011). These centers offer a modern economic model different from traditional one in terms of offering an alternative to provide all classrooms with educational technology. They also contribute to organizing and classifying learning resources which facilitate access of staff members to them (Thompson et al. 2014).

Use of electronic information resources centers helps faculty members in planning and implementing their teaching activities. They allow faculty members access to use them whenever they find appropriate and search for the needed materials without any restrictions. They help to shift from the traditional schedule into a more flexible one in terms of time, teaching methods and media.

Electronic information resources centers aim at the following:

Supporting study course with related electronic materials. (Hockings et al. 2012)

- Developing research skills and helping faculty members to encourage research and problem solving skills to their students.
- Supporting students with skills and tools that enable them to adapt with and make use of the quick competitive development in the field of information system. (Lau et al. 2015)
- Helping faculty members to use varied teaching methods.
- Helping staff members to exchange their experience for the purpose of developing study courses.
- Allowing opportunities for self-learning.
- Catering for individual differences and meeting students' needs.
- Identifying real attitudes, preferences and aptitudes and potentials of faculty members.
- Helping staff members to guide their students on better ways to obtain information from multiple resources (Chang et al. 2012).

Types of electronic information resources:

First: electronic information resources in terms of coverage and objective manipulation: classified as:

- Electronic information resources related to particular areas of specialization
- Electronic information resources of comprehensive specialization or sometimes known as non-specialized (Leibowitz 2009).
- Electronic information resources general (news, political, informative and televised)

Second: electronic information resources in terms of institution concerns, may be classified as following:

- Electronic information resources belong to commercial institutions (Hani et al. 2013).
- Electronic information resources belong to non-commercial institutions (universities, scientific centers, international and national organizations and projects financed by government or other bodies) (Tripp 2003).

Third: electronic information resources in terms of type of information classified as follows (Lim et al. 2007):

- Bibliographical database.
- Textual numeric database (online, CD-ROMs- magnetic tapes).

Competencies of using electronic information resources centers:

- Identifying electronic information database needed in terms of areas of specialization of faculty members (general and specialized research engines to search websites of publishing of database of electronic information – visiting the location of a university library to view the list of database of electronic information) (Levy et al. 2011).

- Identifying the differences between database of electronic information and the traditional ones: method of setting research variables- identifying number of variables used by faculty members for research- methods of presenting research findings-identifying if the documents are numerated within the database or not-method of presenting summaries of documents (**Al-Busaidi 2013**).
- Identifying methods of entering database of electronic information according to the following use of acronyms; abbreviated names- of database- use of the term databases and full address of electronic databases- entering websites of universities libraries.
- Identifying the main page of databases of electronic information: name of database- searches-advanced searches-glossary of terms used in storing documents and in giving commands (**Noguerón-Liu 2014**).
- Identifying strategies of research in electronic information databases: identifying the type of research in electronic database, selection of research terms, typing the research terms in the appropriate columns-choosing the right conjunctions for research terms-choosing the field of research from the list-selecting the date of publication to the needed document-selecting the language of the document-identifying the needed electronic information about the document- selection of the type of document- selections of other options and identifying type of pictures and needed drawings (**Moreno et al. 2009**).
- Evaluating results of researching electronic information resources
- Centers: reviewing literature and researching using new terms-
- Quick viewing to titles of articles in order to decide how far they are related to the topic under investigation-saving and printing research results and sending them via email.
- Authorization of references obtained on line: this could be through understanding the abbreviations used in quoting- understanding abbreviations that point to the title of the document under investigation, name of author, date of publication and type of source.
- The ability to use the technical support via the internet and use the guidebook of topics (**Cornelius & Gordon 2009**).
- Referring to the bibliography in order to select a new document and start searching using different strategy.
- Referring to the main page to perform a new search and using different variables to reach the target information.

Needs of faculty members to use electronic information resources centers:

There are a number of needs and motives that make faculty members use electronic information resources centers. These needs and motives differ from one user to another in terms of the type of electronic information needed (**Abouel enein 2016**). Needs could be for educational or research purposes, or could be personal or resulting from the surrounding environment. Examples of these needs are: coping with modern developments taking place in academic fields- solving problems regarding academics and conducting scientific research, (**Dauids et al. 2015**). Also, publishing articles - supporting teaching and learning –participation in forums and conferences. There are also professional needs related to taking decisions related to work besides personal needs related to learning or entertainment (**Norman & Siminitus 2006**).

Reasons for establishing electronic information resources centers

There are a number of tasks for electronic information resources centers some of these are: providing electronic information resources related to educational needs, they are useful in developing thinking skills to faculty members and students (**Fahad et al. 2013**). They are also helpful for faculty members and students as they facilitate reaching required information inside or outside their universities (**Basha et al. 2013**). Appropriate use of electronic information resources centers acts as a guide to faculty members to help them select and use needed resources (**Dalveren 2014**).

Factors affecting the use of electronic information resources centers

There are a number of aspects affecting the use of electronic information resources centers. Some of these are: their use, surrounding environment and faculty members. Results from research identified factors affecting the use of these centers related to faculty members as follows: they provide for electronic information and facilitate access to it **Park et al. (2010)**. They allow access to updated information and provide for multi forms of information. There are also some personal factors affecting the use of these centers by faculty members in terms of age, academic rank, area of specialization, years of experience and professional needs (**Cegarra-Navarro and Rodríguez 2012**).

In sum to what has been mentioned above, there are a number of factors affecting the use of electronic information centers which can be classified into two categories. First, factors related to the use of electronic information resources centers. Second, factors related to the personal traits of the user and surrounding environment (**Korobili et al. 2006**).

A) Factors related to the use of electronic information resources centers these are:

- The availability of using electronic information resources centers and the range of their modernity (simple or complex- available or unavailable- inside the center or via network- traditional or electronic) (**Pineda-Herrero et al. 2011**).
- Form of electronic information in the electronic resources centers and easiness of use.
- Cost of using electronic information resources centers.
- Increase of electronic information centers as a result of the revolution of published knowledge (**Hartnett & Koury 2012**).
- Time: information requires long time to obtain its value.
- Faculty members rely on the ability of these centers to get information and retrieve it afterwards.

B) Factors related to faculty members (personal factors) (Adnan 2014) These are as follows:

- Age,
- Academic discipline,
- Academic rank,
- Number of years of experience,
- Desire to use electronic information resources centers,
- Problems hindering the use of electronic information resources centers, and
- Ability, comprehensiveness and appropriateness for conducting deep research (**Marković and Jovanović 2012**).

Challenges that hinder use of electronic information resources centers

There are a number of problems hindering faculty members from using electronic information resources centers. Some of these challenges and problems are: lack of well-prepared electronic environment (**Sidgreaves et al. 1987**); lack of cadres of trainers who can train faculty members on using electronic information resource; the rare electronic material that server the university; there is no updating system that could inform about changes and development if different area of specializations; some tools cannot work using Arabic language and require specialized people in language; lack of skills of using electronic information resources centers; lack of electronic information resources centers in most Saudi governmental universities, lack of sufficient time for researching electronic information resources centers, lack of electronic information in Arabic and lack of incentives that encourage faculty members to use electronic information resource centers. In addition, lack of appropriate places for conducting scientific research activities, lack of technicians who can provide support to faculty members, lack of needed electronic information (**Dalveren 2014**), on line information cannot be guaranteed to be there all time and slow downloading is expected (**Abel et al. 2004**).

Research methods and procedures

Population

Population consisted of a group of male and female faculty members in some Saudi universities. Participants included professors, associate professors, assistant professors, lecturers and demonstrators. Questionnaires were administered to (721) faculty members from governmental Saudi Universities. Out of this (66) participant were eliminated as they provided incomplete data. Final number of participants was (655) faculty members from governmental Saudi universities (412) males and (243) females who were selected from different areas of academic disciplines (medical sciences, applied science and humanities) and from different academic ranks. Data collection lasted for one academic year 2015. Numbers of years of experience was also a factor considered in selecting population as shown in the following tables.

Table 1

Distribution of population in terms of gender and academic rank.

Scientific Degree							
Gender	prof	Co-professor	Assistant Prof	lecturer	Teaching Assistant	Total	%
Males	52	98	116	69	77	412	%62.91
Females	33	38	64	53	55	243	%37.09
Total	85	136	180	122	132	655	%100
%	%12.98	%20.76	%27.48	%18.63	%20.15	%100	%

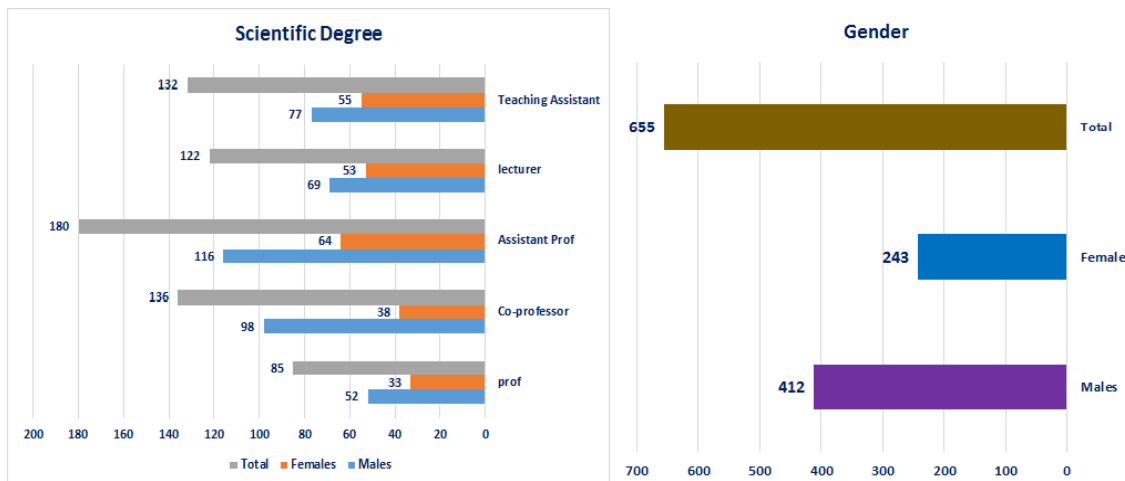


Figure 1. Distribution of population in terms of gender and academic position.

Table 2

Distribution of population in terms of area of academic specialization and number of years of experience

Years of Experience								Academic Specialization					
Gender	Less than 5 years	From 6 years to 10 years	From 11 years to 15 years	From 16 years to 20 years	From 21 years to 25 years	Total	%	Gender	Humanities Sciences	Applied Sciences	Health Sciences	Total	%
Males	138	114	98	31	10	391	%59.69	Males	133	119	104	356	%54.35
Females	95	77	61	23	8	264	%40.31	Females	105	108	86	299	%45.64
Total	233	191	159	54	18	655	%100	Total	238	227	190	655	%100
%	35.57	29.16	24.27	8.24	2.76	%100		%	36.33	34.5	29.17	%100	

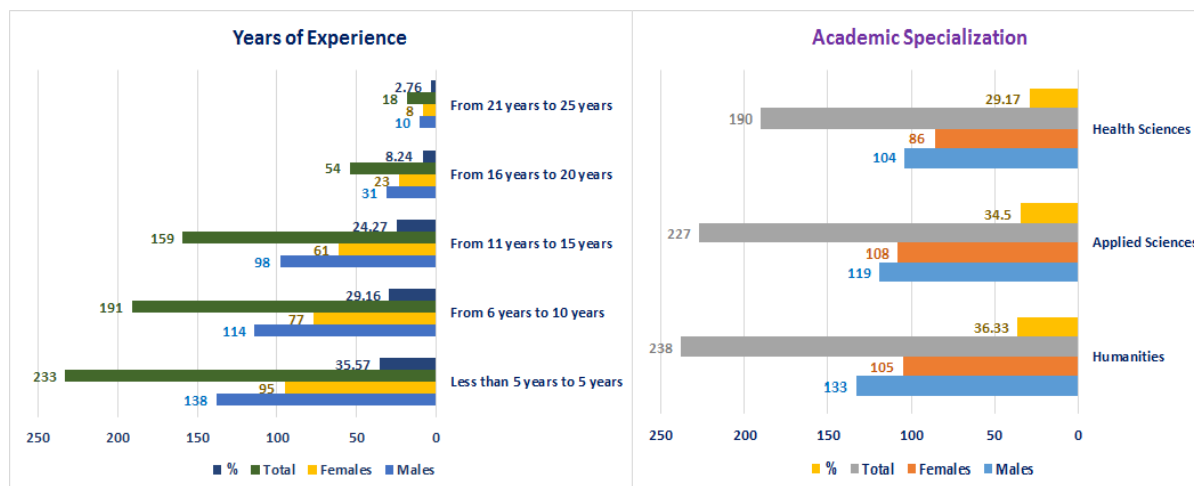


Figure 2. Distribution of population in terms of area of academic specialization and number of years of experience.

Research method

Descriptive analytic method was used to obtain data from research related to the problem of the current study. This is for the purpose of investigating the factual situation of electronic information resources centers in Saudi universities and identifying problems facing them.

Research instrument

Procedures of preparation of a questionnaire of investigating the factual situation of the use of faculty members of electronic information resources centers at Saudi universities.

- Review of literature related to electronic information resources centers and types of electronic information in general.
- Review of findings of research from international journals and conference related to electronic information resources centers in particular.
- Interviewing a number of faculty members in the field of educational technology and electronic learning in order to obtain their views on types of electronic information, problems, competencies, roles, needs of faculty members and affecting factors. In terms of these steps a questionnaire was developed under three categories as follows:
 - **Category one:** dealt with competencies that should be possessed by faculty members to use electronic information resources centers. These competencies were phrased in (10) items with brief explanatory details. Responses were guided by a scale of five options (strongly agree, agree, neutral, disagree and strongly disagree).
 - **Category two:** Dealt with assessing needs of staff members of using electronic information resources centers, these were phrased in (23) items. Responses were guided by a scale of five options (often, always, sometimes, rarely, never).
 - **Category three:** This part dealt with the problems that hinder faculty members from using electronic information resources centers phrased in (11) items. Responses were guided by a scale of five options (often, always, sometimes, rarely, never).

Validity of the questionnaire was measured, procedures are as follows

- **Face validity:** the questionnaire was presented to (23) faculty members specialized in educational technology in some Saudi universities to obtain views on appropriateness and any required modifications.
- Reliability of the questionnaire was measured in terms of a number of procedures as follows. The questionnaire was administered to a group of (23) male and female faculty members in some Saudi universities. Alpha Crookback formula was calculated and reliability reached (0.88).
- **Application of the questionnaire:** it was administered to (655) faculty members from some governmental Saudi Universities.

- **Statistical analysis:** the researcher used SPSS program to measure (mean scores- frequencies- deviations from mean scores- standard of error estimate- differences between mean scores) and Alpha Crookback formula and (Chi square) variables of (gender, degree- number of years of experience- academic areas of specializations) were considered.

Data analysis

The viewpoints of research population from faculty members of some Saudi universities were investigated through the use of a questionnaire in order to verify hypotheses of the research and answer its questions.

First: presentation of data: This study aimed at verifying a number of hypotheses through statistical analysis to data obtained from participants. Views of participants around most important competencies needed by faculty members to use electronic information resources centers, how far faculty members are in need for these centers in their teaching and problems hindering the use of these centers were investigated. Results in terms of the research hypotheses are as follows:

First hypothesis: there is a significant difference at ($\alpha \leq 0.05$) level in the use of faculty members of electronic information resources centers at Saudi universities in terms of gender.

Results related to the first research question 'What are the competencies faculty members at Saudi universities should possess in order to be able to use electronic information resources centers?

In order to answer the first question, statistical data analysis for mean scores, standard deviations and variance for (10) main competencies. Views of participants (412 males and 243 females) were investigated regarding the importance of competencies of using electronic information resources centers through a five scale identifying their responses to questionnaire items. This included (strongly agree- agree- neutral- disagree- strongly disagree).

Table 3

Shows mean scores and standard deviations for competencies of faculty members in using electronic information resources centers.

			Competencies : Male & Female									
Male & Female			1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Males	N	Valid	412	412	412	412	412	412	412	412	412	412
	Mean		4.135	4.017	4.114	4.092	3.990	4.143	4.186	4.029	4.080	4.031
	Std. Deviation		.910	.980	.911	.949	1.015	.931	.954	1.000	1.114	1.148
	Variance		.828	.961	.831	.901	1.032	.868	.911	1.002	1.242	1.320
Females	N	Valid	243	243	243	243	243	243	243	243	243	243
	Mean		4.181	3.987	4.148	4.131	4.323	4.020	4.205	3.983	4.142	4.024
	Std. Deviation		.833	.933	.839	.837	.8339	.9290	.7917	1.003	.7291	.9488
	Variance		.694	.872	.705	.702	.695	.863	.627	1.008	.532	.900

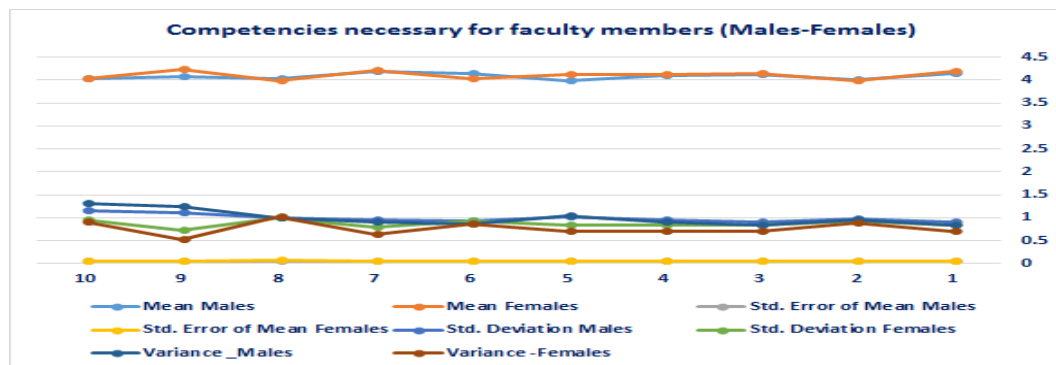


Figure 3. Shows mean scores and standard deviations for competencies of faculty members in using electronic information resources centers.

Results indicated that mean scores of females were (4.110) with standard deviation of (1.113) and a range of variance of responses at (1.241) in terms of the total score of responses. This revealed that there are significant differences ($\alpha \leq 0.05$) level in favor of females. Variance came in favor of females as results of variance were low regarding males. The competency of setting strategies of researching electronic databases was considered the most important one followed by authorization of references obtained on line, then using specialized research engines for searching electronic information resources centers. Degree of variance in males responses were higher than females responses.

Results related to the second question: 'What are the needs of faculty members to use electronic information resources centers?'

In order to answer this question, views of participants (412 males and 243 females) on the needs of faculty members for using electronic information resources centers were investigated through (23) questionnaire items requiring respondents to choose out of five scale measuring system (often- always- sometimes- rarely- never).

Table 4

Shows mean scores and standard deviations for the needs of faculty members to use electronic information resources centers.

Needs : Male & Female																									
Male		&1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	
Female																									
Males	N	Valid	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	
	Mean		3.735	3.708	3.679	3.684	3.689	3.939	3.919	3.808	3.788	3.898	3.9903	4.0097	3.8519	3.7354	3.7621	4.0146	4.1214	4.1092	4.1044	4.1311	4.2087	4.186	
	Std. Deviation		1.202	1.191	1.166	1.248	1.246	1.077	1.006	1.019	1.031	1.104	1.0339	.94104	1.0670	1.1716	1.1906	1.0532	.97153	.92556	.9339	.90272	.84871	.913	
	Variance		1.449	1.412	1.362	1.560	1.553	1.166	1.010	1.030	1.083	1.210	1.070	.8560	.8869	1.139	1.373	1.418	1.109	.944	.857	.872	.815	.720	.834
Females	N	Valid	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	
	Mean		4.032	4.123	4.057	4.197	4.292	4.045	3.995	3.658	3.271	3.234	4.024	4.053	4.032	4.070	4.152	4.362	4.316	4.242	4.222	4.053	4.131	4.160	4.123
	Std. Deviation		.9482	.7983	.7857	.7407	.6172	.8585	.8605	1.103	1.276	1.294	1.075	1.037	.9743	.8902	.9433	.7219	.8346	.8046	.9181	.9366	.9040	.8689	.9052
	Variance		.900	.638	.617	.548	.381	.738	.740	1.218	1.628	1.676	1.156	1.076	.949	.793	.890	.521	.697	.647	.843	.877	.817	.755	.819

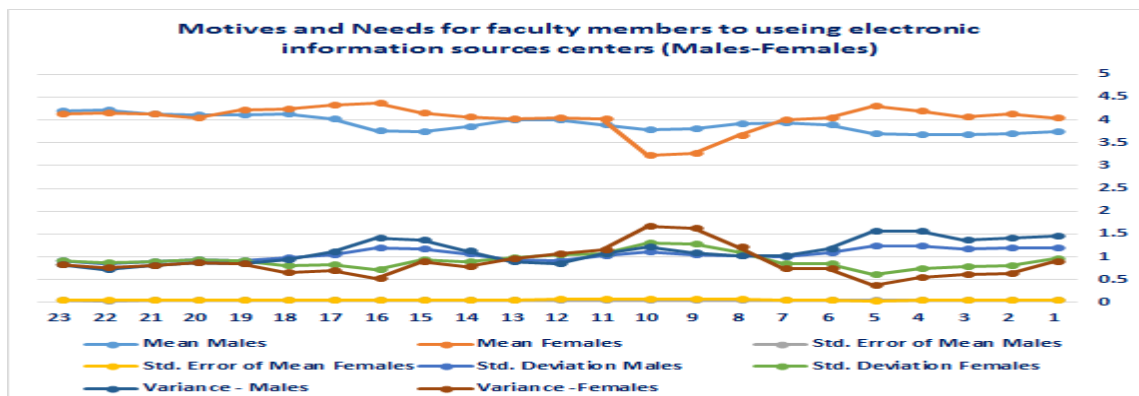


Figure 4. Shows mean scores and standard deviations for the needs of faculty members to use electronic information resources centers.

Results indicate that there are significant differences between males and females at ($\alpha \leq 0.05$) in favor of females as their mean score was (4.036) with standard deviation of (0.942) and degree of variance of (1.031). Mean score of males was (3.902) with standard deviation of (1.015) and degree of variance of (0.903). Thus, the degree of variance between males was higher than degree of variance between females. This resulted in the significant

differences in favor of females. Needs related to teaching could be classified in terms of importance as follows: questionnaire item stating 'allowing opportunities for self-learning' came to be of most important, followed by 'catering for individual differences and meeting students' needs, then continuous support of teaching and learning and authoring, followed by discovering students' potentials and finally developing students' abilities to reach information using various resources.

Results related to the third question What are the challenges that hinder faculty members at Saudi university from using electronic information resources centers?

In order to answer this question, views on participants (412 males and 243 females) were investigated regarding challenges facing them in using electronic information resources centers through (11) items to investigate the challenges facing faculty members in using electronic information resources centers, with five scale measure requiring a choice among: (often- always- sometimes-rarely- never). This is illustrated in Table 5 & Figure 5 below.

Table 5

Shows mean scores and standard deviations for challenges facing faculty members (males and females) in using electronic information resources centers.

Challenges : Male & Female														
Male & Female			M & F	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Males	N	Valid	412	412	412	412	412	412	412	412	412	412	412	412
	Mean		1.000	3.927	4.002	4.101	3.915	4.014	4.068	3.747	3.893	3.941	3.737	3.686
	Std. Deviation		.000	.951	.926	.822	.998	.946	.9308	1.096	1.061	1.056	1.145	1.192
	Variance		.000	.905	.859	.676	.998	.895	.866	1.201	1.127	1.116	1.313	1.422
Females	N	Valid	243	243	243	243	243	243	243	243	243	243	243	243
	Mean		2.000	3.642	3.679	3.831	3.802	3.790	3.860	3.613	3.818	4.041	3.975	3.786
	Std. Deviation		.000	1.232	1.176	1.098	1.053	1.072	1.115	1.167	1.164	1.007	.966	1.169
	Variance		.000	1.520	1.384	1.207	1.110	1.150	1.245	1.362	1.356	1.015	.933	1.367

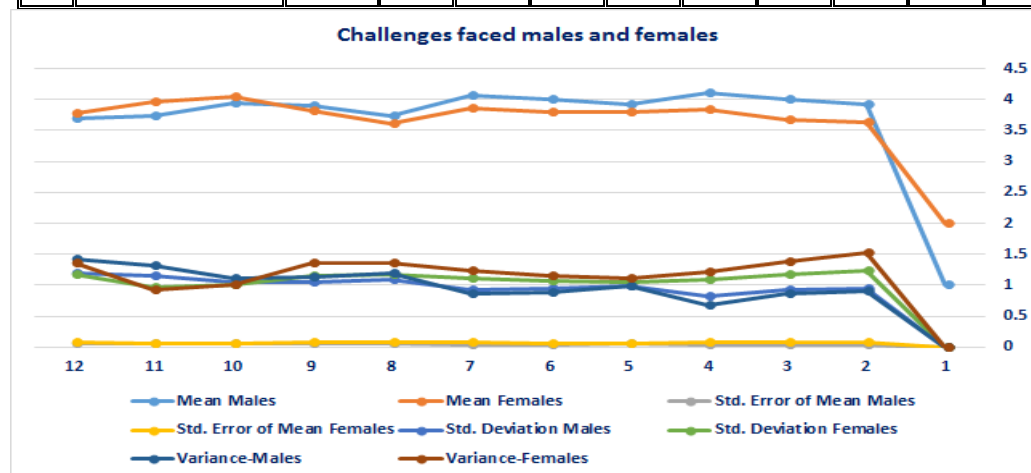


Figure 5. Shows mean scores and standard deviations for challenges facing faculty members (males and females) in using electronic information resources centers.

Results indicate that there are significant differences at ($\alpha \leq 0.05$) in favor of males as their mean score was (3.911) with standard deviation of (0.995) and degree of variance of 0.994. For females, their mean score was (3.803) with standard deviation of (1.153) and degree of variance of (1.323). This shows that there are significant differences in favor of males as their mean scores representing the challenges facing them as follows: there are no electronic information resources centers in their universities. Furthermore, it was revealed that there are no electronic information resources centers serving their universities. Then, the poor use of electronic information resources centers, lack of specialists to train faculty members to use these centers and finally faculty members are not encouraged to use these centers.

D- Results related to the variable of gender (male and female) and its relationship with variables of the study: academic rank, academic area of specialization and number of years of experience. In order to examine this relationship, data were treated statistically to investigate correlation of gender, differences between males and females in terms of academic rank, academic area of specialization and number of years of experience. as shown in Table 6 & Figure 6

Table 6

Shows mean scores and standard deviations for the variable of gender and its correlation with variables of the study: academic rank, academic area of specialization and the number of years of experience.

Comparison between the study variables : Gender					
Gender			Scientific Degree	Academic Specialization	Years of Experience
Males	N	Valid	412	412	412
	Mean		3.3471	1.9466	2.3010
	Std. Deviation		1.30446	.82660	1.16381
	Variance		1.702	.683	1.354
Females	N	Valid	243	243	243
	Mean		2.0823	1.8930	1.8519
	Std. Deviation		.84392	.76929	.83978
	Variance		.712	.592	.705

The above table shows that differences between mean scores related to academic rank, academic area of specialization and number of years of experience came in favor of males and were significant at ($\alpha \leq 0.05$) level.

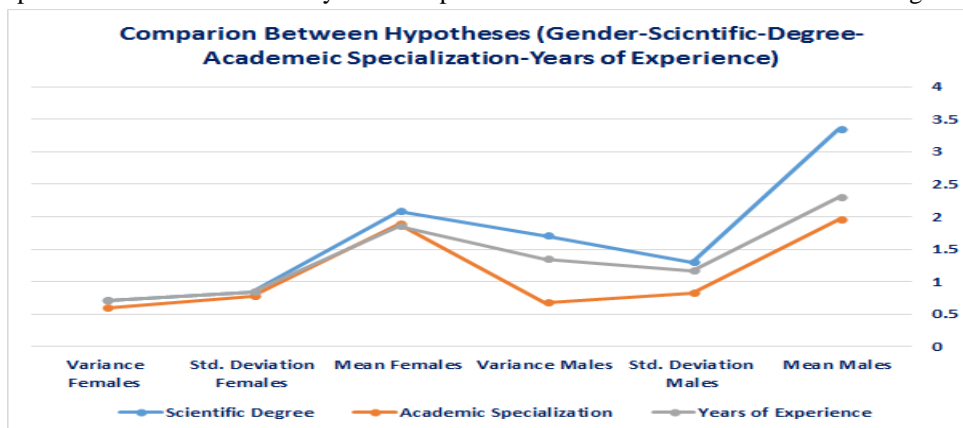


Figure 6. Shows mean scores and standard deviations for the variable of gender and its correlation with variables of the study: academic rank, academic area of specialization and number of years of experience.

Comparisons of standard deviations to the mean scores between males and females show that deviations were higher to males than females. This indicated the correlation between gender and the variables of the study: academic area of specialization and number of years of experience. Degree of variance is higher regarding males more than females.

Second hypothesis: There are significant differences at ($\alpha \leq 0.05$) level regarding the use of faculty members at Saudi universities to electronic information resources centers in terms of academic rank. In order to verify the second hypothesis data were treated in three stages related to the question of the study (competencies- needs- challenges) and details are as follows:

Results related to the first question: What are the competencies faculty members at Saudi universities should posses in order to be able to use electronic information resources centers?

Results of investigating views of faculty members participating in this study in terms of academic rank (132 demonstrator- 122 lecturer-180 assistant professors-136 associate professors and 85 professors) regarding competencies needed for using electronic information resources centers. They were asked to respond to (10) questionnaire items and were asked to select among five scale measure (strongly agree, agree, neutral, disagree and strongly disagree). As shown in Table 7 & Figure 7

Table 7

Shows mean scores and standard deviations of academic rank and its correlation with competencies needed for using electronic information resources centers.

Competencies : Scientific Degree												
Scientific Degree			1	2	3	4	5	6	7	8	9	10
Teaching Assistant	N	Valid	132	132	132	132	132	132	132	132	132	132
	Mean		4.121	3.916	4.053	4.098	4.090	4.045	3.992	3.833	4.075	3.886
	Std. Deviation		.9493	.9888	.9909	.8636	.8948	.9639	1.022	1.140	.9777	1.109
	Variance		.901	.978	.982	.746	.801	.929	1.046	1.300	.956	1.231
Lecturer	N	Valid	122	122	122	122	122	122	122	122	122	122
	Mean		4.163	4.032	4.065	4.065	4.049	4.172	4.311	4.106	4.295	4.163
	Std. Deviation		.8367	.9615	.9157	.9769	.9778	.9332	.8037	.8889	.8099	.9565
	Variance		.700	.925	.839	.954	.956	.871	.646	.790	.656	.915
Assistant Prof	N	Valid	180	180	180	180	180	180	180	180	180	180
	Mean		4.244	4.011	4.222	4.050	4.056	4.133	4.288	4.138	4.211	4.088
	Std. Deviation		.7953	.9092	.7212	.8734	.9497	.8548	.7873	.9499	.8906	.9819
	Variance		.633	.827	.520	.763	.902	.731	.620	.902	.793	.964
Co-professor	N	Valid	136	136	136	136	136	136	136	136	136	136
	Mean		4.125	4.080	4.198	4.220	3.992	4.022	4.117	3.808	3.985	3.897
	Std. Deviation		.9304	.9031	.7680	.8665	.9698	1.007	.9741	1.078	1.161	1.194
	Variance		.866	.816	.590	.751	.941	1.014	.949	1.163	1.348	1.426
prof	N	Valid	85	85	85	85	85	85	85	85	85	85
	Mean		4.035	3.976	4.011	4.117	3.988	4.117	4.258	4.211	4.117	4.141
	Std. Deviation		.9315	1.123	1.117	1.016	1.005	.9182	.8612	.8031	1.127	1.166
	Variance		.868	1.261	1.250	1.034	1.012	.843	.742	.645	1.272	1.361

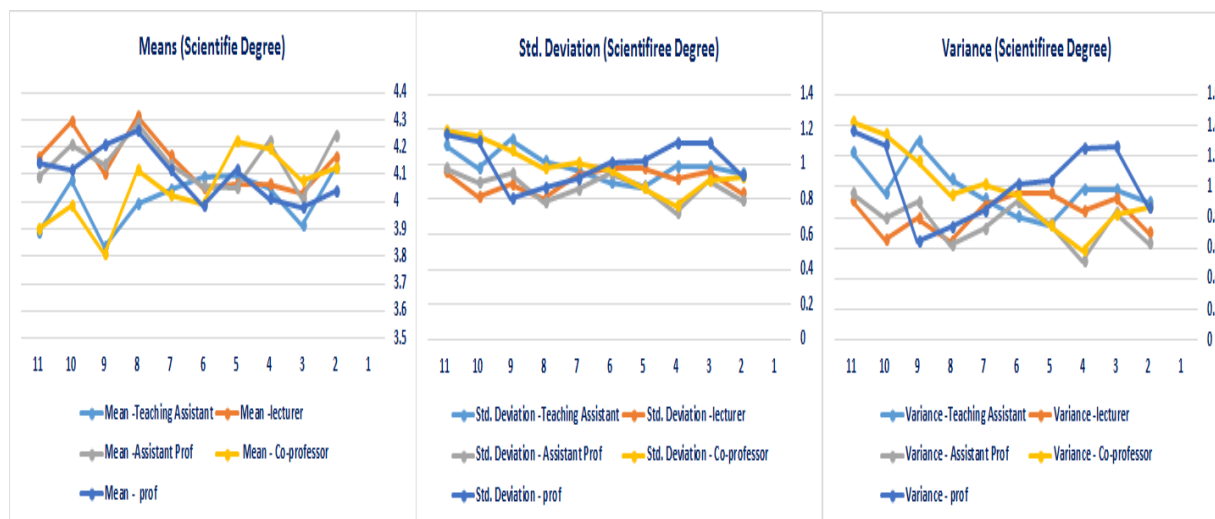


Figure 7. Shows mean scores and standard deviations of academic rank and its correlation with competencies needed for using electronic information resources centers.

Statistical analysis of data shows significant differences among academic ranks at ($\alpha \leq 0.05$) as mean score of demonstrators was (4.010) with standard deviation of (0.893) and degree of variance of (0.801). Mean score of lecturers was (4.142) with standard deviation of (1.64) and degree of variance of (1.362). Mean score for assistant professors was (4.132) with standard deviation of (0.942) and degree of variance of (0.928). Mean score for professors was (4.088) with standard deviation of (0.904) and degree of variance of (0.816). The above results indicated that there are significant differences among different academic ranks in terms of: (demonstrators- lecturers- assistant professors-professors). This result is assured since the competency of identifying electronic information databases in terms of the academic area of specialization came on top, then authorization of on line references followed by evaluation of search results, after that identifying components of main page of electronic databases and finally, the ability to use direct technical support and topics guide on line.

Results related to the second question: What are the needs of faculty members to use electronic information resources centers for?

Investigation of views of faculty members regarding needs of using electronic information resources centers in terms of academic rank (132 demonstrators- 122 lecturers-180 assistant professors-associate professors -136 associate professors- 82 professors) through (23) items on a questionnaire requiring them to choose among five options (often- always-sometimes-rarely- never).

Table 8

Shows mean scores and standard deviations of academic ranks and their correlation with needs of using electronic information resources centers

Needs : Scientific Degree																									
Scientific Degree			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Teaching Assistant	N	Valid	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
	Mean		3.583	3.719	3.825	3.734	3.742	4.068	4.045	3.954	3.681	3.848	4.037	4.033	4.053	3.916	3.833	3.803	4.2955	4.272	4.280	4.189	4.181	4.181	4.212
	Std. Deviation		1.198	1.167	.9999	1.144	1.169	.8666	.9159	.9235	1.086	1.142	1.058	1.033	.9435	1.026	1.120	1.142	.83564	.865	.849	.839	.9148	.836	.838
	Variance		1.436	1.364	1.000	1.311	1.368	.751	.838	.853	1.180	1.305	1.121	1.07	.890	1.054	1.254	1.304	.698	.749	.722	.704	.837	.700	.703
Lecturer	N	Valid	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
	M		4.082	4.090	3.967	4.114	4.098	4.008	3.745	3.803	3.582	3.401	3.918	4.066	4.008	4.082	4.147	3.9016	3.868	4.057	3.729	3.991	4.041	4.016	

	Std. Deviation		.905	.843	.952	.873	.912	.904	1.01	1.11	1.22	1.28	1.0	.90	.878	.931	.932	.915	1.03	.995	.956	.953	.974	.903	.987
	Variance		.820	.711	.908	.764	.833	.818	1.034	1.250	1.501	1.647	1.117	.822	.773	.868	.869	.838	1.065	.991	.914	.910	.950	.816	.975
Assistant Prof	N	Valid	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
	Mean		4.077	4.105	3.944	4.061	4.164	3.846	3.866	3.566	3.305	3.216	3.961	4.058	3.983	3.930	4.000	4.388	4.344	4.211	4.161	4.227	4.183	4.266	4.100
	Std. Deviation		.893	.815	.907	.916	.819	1.018	.993	1.143	1.320	1.274	1.099	1.043	1.044	1.118	.696	.807	.852	.946	.895	.842	.829	.940	
	Variance		.798	.665	.824	.840	.672	1.037	.988	1.308	1.744	1.623	1.136	.986	1.084	1.091	1.251	.485	.652	.726	.896	.803	.709	.688	.884
Co-professor	N	Valid	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136
	Mean		3.772	3.727	3.727	3.897	3.838	3.973	4.075	3.845	3.764	3.713	3.895	3.966	4.061	3.914	3.790	3.720	3.992	4.316	4.183	4.139	4.168	4.198	4.308
	Std. Deviation		1.264	1.232	1.176	1.097	1.168	1.057	.866	1.060	1.027	1.114	1.090	.949	.912	1.021	1.129	1.239	1.098	.875	.904	.990	.86	.823	.873
	Variance		1.600	1.518	1.385	1.204	1.366	1.118	.750	1.124	1.055	1.243	1.189	.902	.833	1.044	1.276	1.536	1.207	.766	.818	.980	.749	.679	.763
prof	N	Valid	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
	Mean		3.541	3.458	3.482	3.317	3.505	3.870	4.152	4.152	3.929	4.000	3.882	3.912	3.882	3.622	3.600	3.941	4.094	4.011	4.047	4.082	4.247	4.200	
	Std. Deviation		1.314	1.286	1.287	1.521	1.413	1.203	.919	.823	.856	.899	.947	.928	.943	1.016	1.224	1.283	1.168	.971	.957	.924	.953	.911	.870
	Variance		1.727	1.656	1.657	2.315	1.991	1.447	.845	.679	.733	.810	.891	.862	.891	1.034	1.499	1.648	1.366	.943	.917	.855	.910	.831	.757

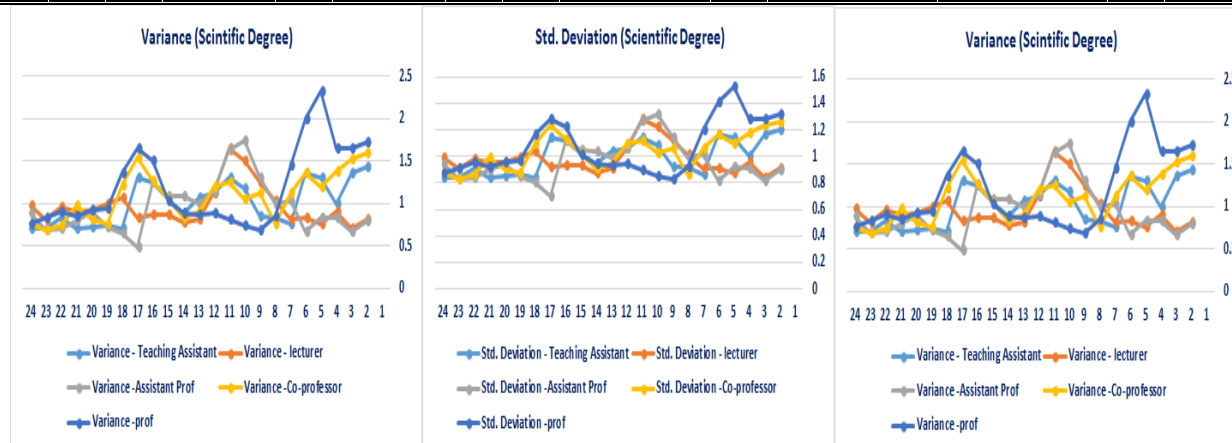


Figure 8. Shows mean scores and standard deviations of academic ranks and their correlation with needs of using electronic information resources centers.

Data analysis revealed that there are significant differences among academic ranks at ($\alpha \leq 0.05$) level, since mean score of demonstrators was (3.977) with standard deviation of (1.013) and degree of variance of (1.041), for lecturers, their mean score was (3.907) with standard deviation of (1.001) and degree of variance of (1.023), mean scores of assistant professors was (3.815) with standard deviation of (1.180) and degree of variance of (1.311), mean scores of associate professor was (4.120) with standard deviation of (0.819) and degree of

variance of (0.672) and the mean score of professors was (3.861) with standard deviation of (1.016) and degree of variance of (0.943). This is revealed since the item of using and learning at the appropriate times came on top, then discovery of potentials and aptitudes, followed by supporting preparation and implementation of lectures, then providing an economic alternative to save costs of preparation of classrooms with technologies and finally came developing students' abilities to obtain information from multi-sources.

Results related to the third question: What are the challenges that hinder faculty members at Saudi university from using electronic information resources centers?

Statistical analysis of views of participants in terms of academic ranks (132 demonstrators- 122 lecturers-180 assistant professors-associate professors -136 associate professors- 82 professors) around challenges facing them in using electronic information resources centers were investigated through questionnaire items requiring them to select among five options (often- always-sometimes-rarely- never).

Table 9

Shows mean scores and standard deviations of academic ranks and their correlation with challenges of using electronic information resources centers.

Challenges : Scientific Degree												
Scientific Degree		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Teaching Assistant	N Valid	132	132	132	132	132	132	132	132	132	132	132
	Mean	3.507	3.621	4.136	3.939	4.022	3.909	3.863	3.848	4.159	4.022	4.037
	Std. Deviation	1.257	1.207	.9144	1.075	.9202	1.029	1.046	1.066	.7895	.8949	.9197
	Variance	1.580	1.458	.836	1.157	.847	1.060	1.096	1.137	.623	.801	.846
Lecturer	N Valid	122	122	122	122	122	122	122	122	122	122	122
	Mean	3.844	3.868	3.762	3.762	3.918	4.000	3.598	3.647	4.147	3.934	4.082
	Std. Deviation	1.060	1.075	1.091	1.135	1.017	1.020	1.118	1.219	.8969	.9936	.9144
	Variance	1.124	1.156	1.191	1.290	1.035	1.041	1.251	1.486	.804	.987	.836
Assistant Prof	N Valid	180	180	180	180	180	180	180	180	180	180	180
	Mean	3.983	3.950	3.977	3.811	3.827	4.005	3.594	3.916	3.744	3.572	3.211
	Std. Deviation	.9715	.9470	.9451	.9559	1.061	1.038	1.132	1.132	1.196	1.223	1.341
	Variance	.944	.897	.893	.914	1.127	1.078	1.282	1.284	1.432	1.498	1.799
Co-professor	N Valid	136	136	136	136	136	136	136	136	136	136	136
	Mean	3.963	3.970	4.139	4.000	3.992	4.022	3.757	3.992	3.926	3.823	3.647
	Std. Deviation	.8978	.9579	.7810	.9428	.9775	.9772	1.176	.9775	1.106	1.134	1.226
	Variance	.806	.918	.610	.889	.956	.955	1.385	.956	1.224	1.287	1.504
prof	N Valid	85	85	85	85	85	85	85	85	85	85	85
	Mean	3.705	4.023	3.964	3.858	3.929	4.023	3.705	3.894	4.035	3.905	3.929
	Std. Deviation	1.142	.9509	.9315	1.001	.9974	.9509	1.132	1.069	1.017	1.030	1.088
	Variance	1.305	.904	.868	1.004	.995	.904	1.282	1.143	1.034	1.062	1.185

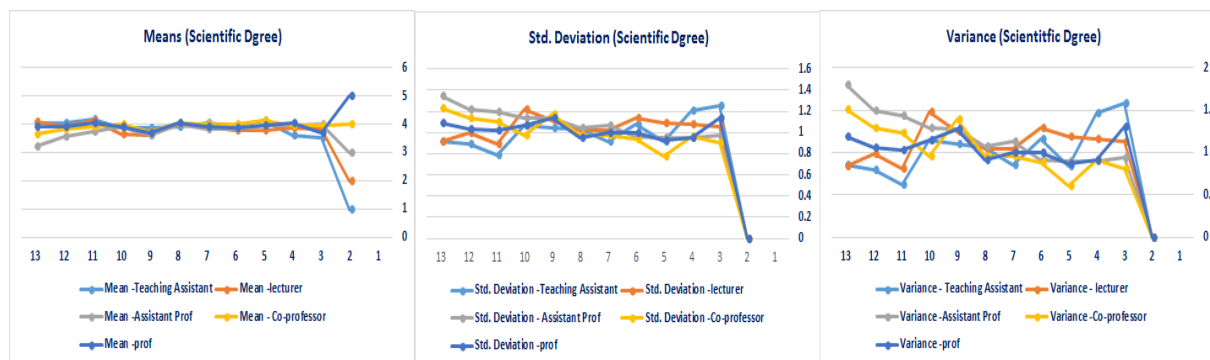


Figure 9. Shows mean scores and standard deviations of academic ranks and their correlation with challenges of using electronic information resources centers.

Analysis of data regarding challenges facing faculty members in using electronic information resources centers in terms of academic ranks showed that there are significant differences among academic ranks at ($\alpha \leq 0.05$) level, since results from participants were as follows: mean scores of demonstrators was (3.914) with standard deviation of (0.918) and a degree of variance of (1.017); mean scores of lecturers was (3.914) with standard deviation of (1.041) and a degree of variance of (1.133), mean scores of assistant professors was (3.780) with standard deviation of (1.136) and degree of variance of (1.080), mean scores of associate professor was (3.930) with standard deviation of (1.080) and a degree of variance of (1.062), and mean scores of professors was (3.906) with standard deviation of (1.028) and a degree of variance of (1.062). the item of lack of electronic information resources centers came on top then, lack of encouragement to faculty members to use electronic information resources centers followed by unavailability of an appropriate place for electronic information resources centers inside universities then, lack of technical support to solve problems facing faculty members searching electronic resources and finally lack of skills of using electronic information resources centers.

Regarding third hypothesis: There are significant differences at ($\alpha \leq 0.05$) level regarding the use of faculty members at Saudi universities to electronic information resources centers in terms of academic area of specialization.

Results related to first question: What are the competencies faculty members at Saudi universities should possess in order to be able to use electronic information resources centers?

The following table shows that results indicated significant differences at ($\alpha \leq 0.05$) level among academic areas of specialization (238 from humanities- 227 from applied sciences- 190 from health sciences) regarding competencies that faculty members should obtain to use electronic information resources centers through a questionnaire requiring them to respond to different items requiring them to choose from five options (often, always, sometimes, rarely and never).

Table 10

Shows mean scores and standard deviations of results related to academic area of specialization and correlation with electronic resources centers.

Competencies : Academic Specialization											
Academic Specialization		1	2	3	4	5	6	7	8	9	10
Humanities	N	Valid	238	238	238	238	238	238	238	238	238
	Mean		4.1008	3.9832	4.1176	4.0630	4.0714	4.0546	4.2017	4.0000	4.1050
	Std. Deviation		.97127	.98498	.90172	.9679	.91353	1.0111	.86253	.98512	1.0441
	Variance		.943	.970	.813	.937	.835	1.022	.744	.970	1.090
Science	N	Valid	227	227	227	227	227	227	227	227	227
	Mean		4.1894	4.0088	4.0837	4.1630	4.0264	4.1674	4.1938	4.0352	4.1498

Sciences	Std. Deviation	.85408	.97305	.90576	.83869	.96359	.82986	.91562	.97245	.93815	1.0553
	Variance	.729	.947	.820	.703	.929	.689	.838	.946	.880	1.114
	N Valid	190	190	190	190	190	190	190	190	190	190
	Mean	4.1737	4.0316	4.1895	4.0947	4.0158	4.0684	4.1842	4.0000	4.1737	4.0684
	Std. Deviation	.79439	.92528	.83943	.91517	.99457	.94312	.92168	1.0591	.99008	1.0442
	Variance	.631	.856	.705	.838	.989	.889	.849	1.122	.980	1.091

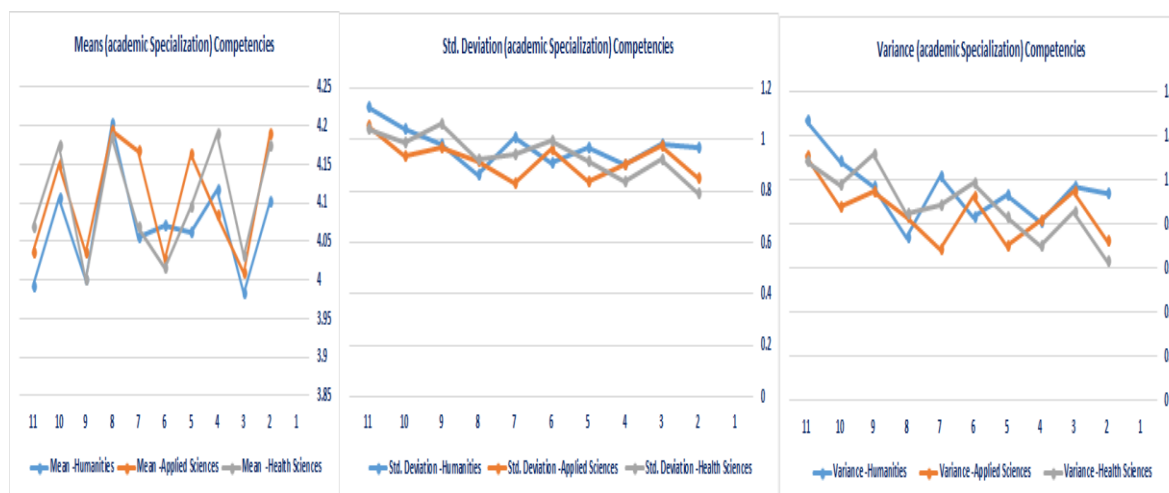


Figure 10. Shows mean scores and standard deviations of results related to academic area of specialization and correlation with electronic resources centers.

Statistical analysis of data regarding competencies needed for faculty members revealed that there are significant differences among faculty members in terms of academic areas of specialization at ($\alpha \leq 0.05$) details of this could be explained as follows. Mean scores of humanities was (4.068) with standard deviation of (0.967) and a degree of variance of (0.937), mean scores of applied sciences was (4.104) with standard deviation of (1.044) and a degree of variance of (1.090) and mean scores of health sciences was (4.099) with standard deviation of (0.973) and a degree of variance of (0.947). qualitative interpretation of this resulted in the following: selection of the item 'referring to the citation page to choose a new document cam on the top followed by documentation of references obtained on line, then setting a strategy for searching electronic databases, then identifying databases needed in terms of academic area of specialization and finally entering electronic databases using their abbreviated names.

Results related to the second question: What are the needs of faculty members to use electronic information resources centers for?

The following table shows results of statistical analysis of data obtained in terms of academic area of specialization (238 from humanities- 227 from applied sciences- 190 from health sciences) indicating that there are significant differences at ($\alpha \leq 0.05$) level among academic areas of specialization which determine the need of faculty members to use electronic information resources centers based on a questionnaire using five scales (strongly agree- agree- neutral- disagree- strongly disagree).

Table 11

Shows mean scores and standard deviations of academic areas of specialization and correlation with needs of faculty members to use electronic information resources centers.

Needs : Academic Specialization																							
Academic Specialization	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
N Valid	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238

	Mean	3.945	3.9328	3.9118	3.9034	4.0126	4.0000	3.9370	3.8403	3.554	3.546	3.937	4.084	4.071	3.907	3.924	4.050	4.319	4.2521	4.210	4.197	4.193	4.214	4.222
	Std. Deviation	1.079	1.0492	.98757	1.0449	1.0692	.98512	.96796	1.0868	1.184	1.254	1.0792	.9008	.9402	1.028	1.048	1.05	.8469	.9067	.898	.899	.878	.8320	.907
	Variance	1.166	1.101	.975	1.092	1.143	.970	.937	1.181	1.404	1.574	1.165	.811	.885	1.046	1.100	1.103	.716	.822	.808	.809	.773	.692	.824
	N Valid	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227
Applied Sciences	Mean	3.775	3.8326	3.7445	3.8899	3.8767	3.9515	3.9692	3.8062	3.682	3.599	3.8855	3.947	4.013	3.889	3.810	3.898	3.969	4.101	4.074	4.035	4.118	4.158	4.185
	Std. Deviation	1.127	1.0800	1.1272	1.1214	1.1299	.99215	.94725	1.0207	1.123	1.172	1.0829	1.054	.9750	1.009	1.1423	1.124	1.07	.9560	.9540	.9255	.9116	.8526	.878
	Variance	1.272	1.167	1.271	1.258	1.277	.984	.897	1.042	1.262	1.374	1.173	1.112	.951	1.001	1.322	1.260	1.154	.914	.910	.857	.831	.727	.771
	N Valid	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190
Health Sciences	Mean	3.805	3.8105	3.7947	3.8211	3.8316	3.8895	3.9789	3.8211	3.589	3.610	4.0263	4.005	3.957	4.015	3.942	4.0053	4.073	4.136	4.168	4.005	4.068	4.200	4.063
	Std. Deviation	1.167	1.1202	1.0515	1.1950	1.0852	1.0457	.95373	1.0638	1.177	1.188	.97283	.939	.941	1.005	1.137	1.0665	1.0104	.8680	.9165	.978	.920	.8920	.946
	Variance	1.364	1.255	1.106	1.428	1.178	1.094	.910	1.132	1.386	1.414	.946	.884	.887	1.010	1.293	1.138	1.021	.754	.839	.958	.847	.796	.895
	N Valid	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190

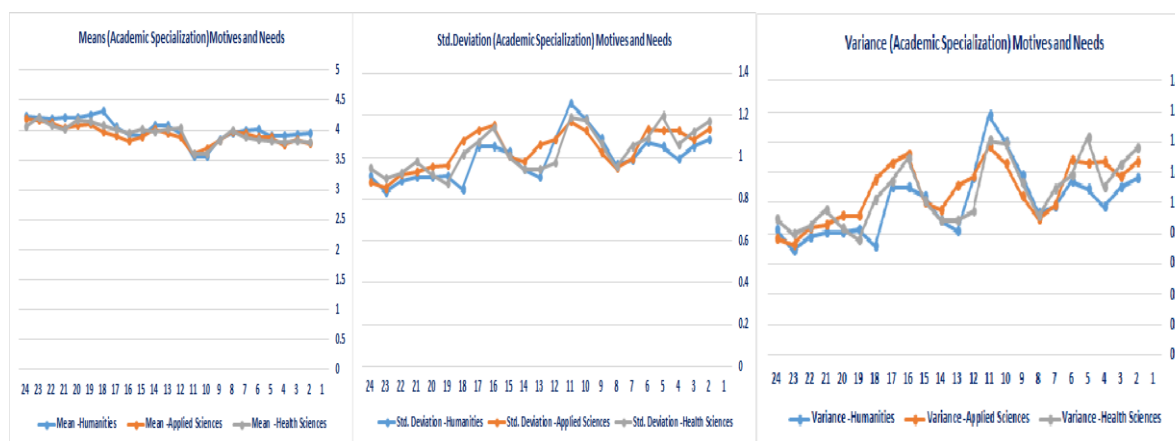


Figure 11. Shows mean scores and standard deviations of academic areas of specialization and correlation with needs of faculty members to use electronic information resources centers.

Data analysis revealed that there are significant differences among faculty members in terms of academic areas of specialization at ($\alpha \leq 0.05$), details are as follows. Mean scores of participants from humanities were (4.178) with standard deviation of (0.987) and a degree of variance of (0.868) and mean score of participants from applied science was (3.921) with standard deviation of (0.975), mean scores of participants from health sciences was (3.939) with standard deviation of (0.976) and a degree of variance of (0.975). qualitative examination of these results showed that needs of faculty members to 'developing research skills , discovery and thinking skills' on top followed by providing students with skills enable them to adapt and make use of competitive developments in information systems. Then 'dealing with individual difference', after that, discovering potentials and aptitudes, then using and leaning at the appropriate times, then supporting preparation and implementation of lectures and finally developing students' abilities in obtaining information from different sources.

Results related to the third question: What are the challenges that hinder faculty members at Saudi university from using electronic information resources centers?

The following table shows results of statistical analysis of views of participants on challenges facing faculty members of different areas of specialization in using electronic information resources centers. Results indicate

that there are significant differences at ($\alpha \leq 0.05$), level among academic areas of specialization (238 from humanities- 227 participants from applied sciences- 190 participants from health sciences).

Table 12

Shows mean scores and standard deviations of different areas of academic specialization and correlation with using electronic information resources centers.

Challenges : Academic Specialization													
Academic Specialization			1	2	3	4	5	6	7	8	9	10	11
Humanities	N	Valid	238	238	238	238	238	238	238	238	238	238	238
	Mean		3.806	3.962	4.016	3.907	3.974	3.970	3.852	3.789	3.953	3.785	3.701
	Std. Deviation		1.065	.9865	.9138	1.010	.9890	1.032	1.039	1.150	1.064	1.117	1.235
	Variance		1.135	.973	.835	1.021	.978	1.067	1.080	1.323	1.133	1.249	1.527
Sciences	N	Valid	227	227	227	227	227	227	227	227	227	227	227
	Mean		3.643	3.810	3.969	3.806	3.876	3.889	3.634	3.964	3.973	3.810	3.718
	Std. Deviation		1.136	1.086	1.001	1.020	1.018	1.064	1.122	1.051	1.004	1.070	1.171
	Variance		1.292	1.181	1.003	1.042	1.038	1.134	1.260	1.105	1.008	1.145	1.371
Sciences	N	Valid	190	190	190	190	190	190	190	190	190	190	190
	Mean		4.052	3.868	4.021	3.910	3.942	4.136	3.578	3.842	4.015	3.894	3.757
	Std. Deviation		.9580	1.038	.9082	1.032	.9930	.8862	1.209	1.091	1.051	1.073	1.138
	Variance		.918	1.078	.825	1.066	.986	.785	1.462	1.192	1.106	1.153	1.296

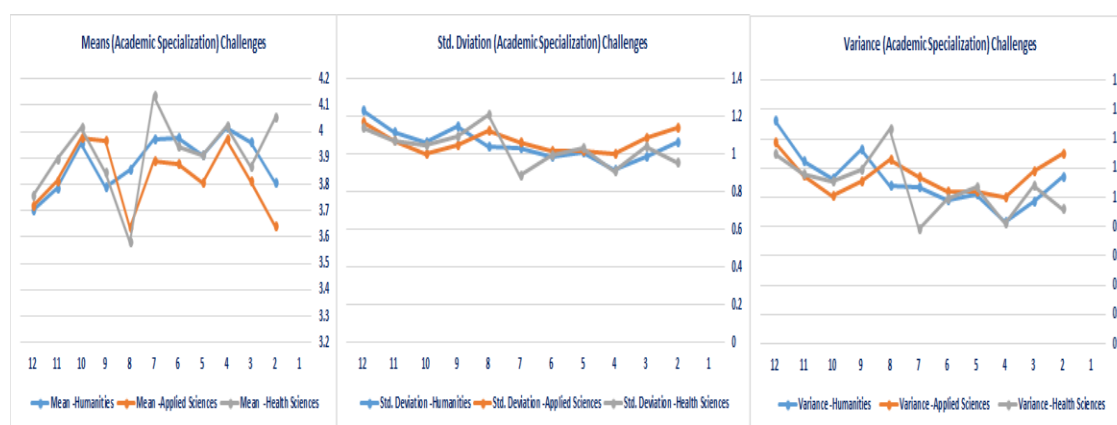


Figure 12. Shows mean scores and standard deviations of different areas of academic specialization and correlation with using electronic information resources centers.

Data analysis regarding challenges facing faculty members revealed that there are significant differences in terms of academic areas of specialization at ($\alpha \leq 0.05$), level. This is interpreted as follows. Mean score of participants from humanities was (3.883) with standard deviation of (1.064) and a degree of variance of (1.134), mean score of participants from applied science was (3.826) with standard deviation of (1.083) and a degree of variance of (1.181) and mean score of participants from health sciences was (3.910) with standard deviation of (1.032) and a degree of variance of (1.066). The biggest challenges facing faculty members and selected on top of all items was 'lack of encouragement to help faculty members use electronic information resources centers'. followed this 'lack of electronic information resources centers, then lack of electronic information resources serving the university, after that lack of electronic information resources centers in Arabic and finally, lack of modern electronic environment that are supported with modern programs in colleges of the university.

Fourth hypotheses: There are significant differences at ($\alpha \leq 0.05$), level regarding the use of faculty members at Saudi universities to electronic information resources centers in terms of number of years of experience.

Results related to the first question: What are the competencies faculty members at Saudi universities should posses in order to be able to use electronic information resources centers?

The following table shows statistical analysis of data related to the variable of number of years of experience (from 1-5, from 6-10, from 11-16, from 16-20 and from 21-25) and its correlation with competencies needed to use electronic information resources centers. Results indicated that there are significant differences at ($\alpha \leq 0.05$), based on the five scales (often- always- sometimes-rarely-never). As described in Table 13 & Figure 13.

Table 13

Shows mean scores and standard deviations of number of years of experience and its correlation with competencies needed to use electronic information resources centers.

Competencies : Years of Experience											
Years of Experience		1	2	3	4.	5	6	7	8	9	10
Less than 5 years to 5 years	N Valid	233	233	233	233	233	233	233	233	233	233
	Mean	4.060	3.931	4.073	4.073	4.107	3.995	4.180	4.000	4.094	3.970
	Std. Deviation	.9763	1.006	.9232	.9688	.9009	1.010	.8570	.9782	1.042	1.127
	Variance	1.238	.968	.819	1.022	1.017	1.020	1.100	1.285	1.069	1.196
From 6 years to 10 years	N Valid	191	191	191	191	191	191	191	191	191	191
	Mean	4.157	3.989	4.094	4.162	4.015	4.193	4.214	3.984	4.162	4.026
	Std. Deviation	.8923	.9732	.9185	.8334	.9429	.8578	.9124	1.028	.9346	1.083
	Variance	1.320	1.315	1.149	1.048	1.008	1.305	1.242	1.241	1.067	1.096
From 11 years to 15 years	N Valid	159	159	159	159	159	159	159	159	159	159
	Mean	4.226	4.088	4.213	4.207	3.993	4.213	4.169	4.056	4.144	4.132
	Std. Deviation	.7707	.8886	.8063	.7801	.9840	.7824	.9154	1.026	1.011	.9879
	Variance	.949	1.006	.784	1.078	1.045	.699	1.604	1.205	1.082	1.210
From 16 years to 20 years	N Valid	54	54	54	54	54	54	54	54	54	54
	Mean	4.240	4.018	4.111	3.759	3.888	3.814	4.203	3.981	4.222	3.907
	Std. Deviation	.7251	.9613	.8831	1.148	1.176	1.133	.9977	.9212	.9450	1.153
	Variance	.667	.924	.632	.929	.792	.598	.896	.803	1.157	1.261
From 21 years to 25 years	N Valid	18	18	18	18	18	18	18	18	18	18
	Mean	4.388	4.388	4.444	4.111	4.277	4.222	4.333	4.166	4.222	4.277
	Std. Deviation	.7775	.8498	.6157	.9633	.6691	.9428	.8401	1.098	.9428	.8947
	Variance	.693	.997	.735	1.232	1.114	1.163	1.324	1.359	1.294	1.412

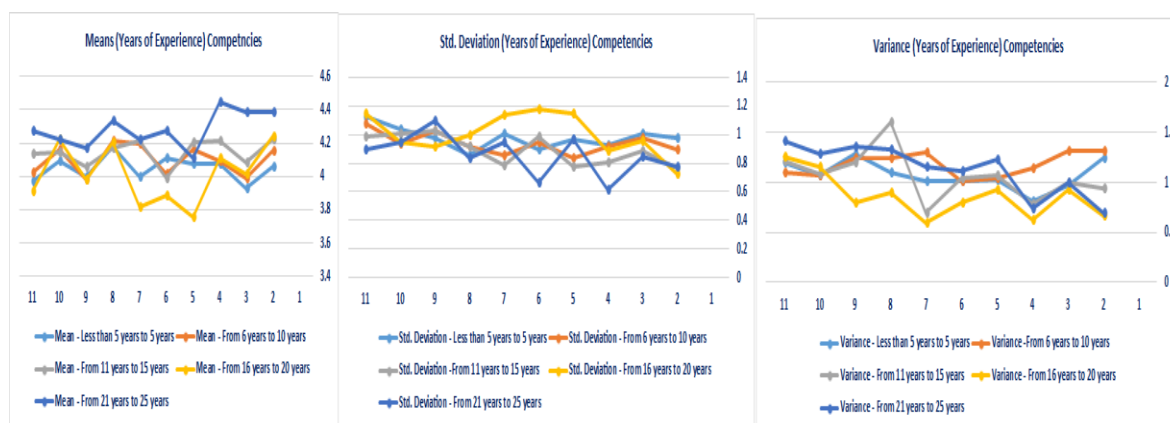


Figure 13. Shows mean scores and standard deviations of number of years of experience and its correlation with competencies needed for faculty members to use electronic information resources centers.

Results indicated that there are significant differences at ($\alpha \leq 0.05$), level based on the five scales (often, always, sometimes, rarely and never) in terms of number of years of experience interpreted as follows. Mean scores of experience ranged from one year to five was (3.553) with standard deviation of (1.029) and a degree of variance of (1.028), mean scores of number of years of experience ranged from six to ten was (9.099) with standard deviation of (1.068) and a degree of variance of (1.301), mean scores of number of years of experience ranged from eleven to fifteen was (4.014) with standard deviation of (0.930) and a degree of variance of (0.865), mean scores of number of years of experience ranged from sixteen to twenty was (4.144) with standard deviation of (0.972) and a degree of variance of (0.843) and mean scores of number of years of experience ranged from twenty one to twenty five was (4.282) with standard deviation of (0.894) and a degree of variance of (0.801). The most important competency revealed and top selected was 'ability to use direct technical support on line and use of topic guide, followed by setting a strategy for searching electronic databases, then identifying components of the main page of electronic databases, after that entering electronic databases using the abbreviated names, then identifying different types of electronic databases and finally method of arranging variables when searching electronic databases.

Results related to the second questions: What are the needs of faculty members to use electronic information resources centers for?

The following table deals with results from statistical analysis for the variable of number of years of experience (from: 1-5, 6-10, 11-15, 16-20 and 21-25).

And the relationship with needs of faculty members through responding to items of a questionnaire selecting among five scales measure (often- always-sometimes-rarely- never). Results indicated significant differences at ($\alpha \leq 0.05$). As illustrated in Table 14 & Figure 14.

Table 14

Shows mean scores and standard deviations of number of years of experience and its relation with needs of staff members of using electronic information resources centers.

	Needs : Y																			
ree	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11	12	13	14	15	16	17	18	19	20
	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233
	3.90	3.90	3.89	3.91	3.97	4.01	3.96	3.83	3.56	3.99	4.03	4.03	3.8	3.90	4.03	4.27	4.26	4.17	3.56	4.12
on	1.08	1.02	.990	1.03	1.09	.999	.984	1.07	1.23	1.07	.929	.943	1.01	1.04	1.03	.860	.863	.917	1.23	.910
	1.17	1.05	.981	1.07	1.18	1.00	.968	1.15	1.34	1.53	1.16	.865	.891	1.02	1.10	1.06	.741	.746	.841	.828
	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191
	3.78	3.85	3.73	3.82	3.89	3.94	3.95	3.86	3.56	3.88	4.04	4.04	3.96	3.80	3.86	4.09	4.14	4.15	3.56	4.12
on	1.15	1.06	1.09	1.12	1.12	.950	.893	.990	1.18	1.04	.983	.939	.947	1.12	1.17	1.04	.928	.936	1.18	.906
	1.32	1.13	1.20	1.26	1.25	.903	.798	.981	1.26	1.39	1.09	.967	.882	.899	1.27	1.38	1.09	.863	.877	.822
	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159
	3.85	3.84	3.82	3.99	3.93	3.94	4.08	3.79	3.63	3.62	4.00	3.98	3.98	3.89	3.93	3.98	3.98	4.06	4.11	4.04
on	1.14	1.15	1.08	1.12	1.04	1.03	.885	1.11	1.20	1.18	1.00	1.01	.987	1.07	1.19	1.11	1.07	.994	.930	.950
	1.30	1.33	1.18	1.25	1.08	1.07	.784	1.23	1.44	1.41	1.01	1.03	.975	1.14	1.41	1.24	1.152	.989	.865	.903
	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
	3.77	3.83	3.83	3.70	3.85	3.74	3.61	3.70	3.51	3.44	3.85	3.98	3.85	4.18	4.01	4.12	4.03	4.12	4.05	3.81
on	1.16	1.12	1.11	1.29	1.15	1.08	1.13	1.09	1.22	1.29	1.10	.999	.959	.991	1.09	.847	1.04	.891	.940	1.10
	1.34	1.27	1.23	1.68	1.33	1.17	1.29	1.19	1.50	1.68	1.22	1.00	.921	.984	1.18	.719	1.09	.794	.884	1.21
	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	4.27	3.77	3.55	3.66	3.38	3.33	3.77	3.94	3.83	4.05	3.72	3.72	4.27	3.88	3.77	4.22	4.11	4.11	4.44	4.33
on	.894	1.11	1.19	1.02	1.24	1.13	1.11	1.05	.923	.872	.958	.751	.894	1.07	1.06	.878	.758	.676	.783	.766
	1.24	1.43	1.05	1.54	1.29	1.24	1.11	.853	1.05	.761	.918	.565	.801	1.16	1.12	.771	.575	.458	.614	.588

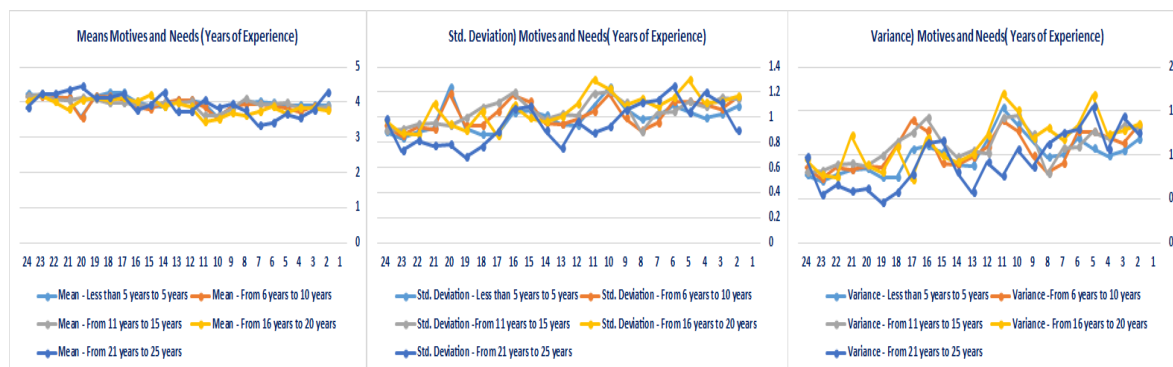


Figure 14. Shows mean scores and standard deviations of number of years of experience and its relation with needs of staff members of using electronic information resources centers.

Results indicated that there are significant differences at ($\alpha \leq 0.05$), level between different numbers of years of experience. This is explained as follows. The mean score of participants of years of experience was (3.808) with standard deviation of and a degree of variance at (1.013). The mean scores of participants of number of years of experience from 6-10 years was (3.926) with standard deviation of (0.984) and a degree of variance of (0.901). The mean scores of participants of number of years experience from 11- 15 years was (3.957) with standard deviation of (1.98) and a degree of variance a (1.410). Mean scores of participants of number of years of experience from 16-20 was (3.881) with standard deviation of (1.153) and a degree of variance at with standard deviation of (1.381). Mean scores of participants of number of years of experience from 21-25 was (3.929) with standard deviation of (0.931) and a degree of variance at (0.879).

The most prominent needs for electronic information resources centers as follows: 'developing students' abilities in reaching information from multi-sources', followed by discovery of potentials', then' allowing the opportunity for self learning', after that, using and learning at the appropriate time, then, assisting in preparation and implementation of lectures and finally, organizing electronic information resources to facilitate reaching them.

Results related to the third question: What are the challenges that hinder faculty members at Saudi university from using electronic information resources centers?

The following table shows results from statistical analysis to variable of number of years of experience (from: 1- 5, 6-10, 11-15, 16-20 and 21-25) and relation with problems that hinder faculty members from using electronic information resources centers through responding to items on a questionnaire requiring selection of five scale measures (often- always- sometimes- rarely- never). Results shows that there are significant differences at ($\alpha \leq 0.05$). As described in Table 15 & Figure 15.

Table 15

Shows mean scores and standard deviations related to number of years of experience and its relation with problem hindering faculty members from using electronic information resources centers.

Challenges : Years of Experience													
Years of Experience			1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Less than 5 years to 5 years	N	Valid	233	233	233	233	233	233	233	233	233	233	233
	Mean		3.716	3.952	4.017	3.939	3.905	3.922	3.841	3.794	4.008	3.798	3.759
	Std. Deviation		1.112	.9836	.9048	1.011	1.008	1.009	1.048	1.133	1.033	1.093	1.182
	Variance		1.238	.968	.819	1.022	1.017	1.020	1.100	1.285	1.069	1.196	1.399
From 6 years to 10 years	N	Valid	191	191	191	191	191	191	191	191	191	191	191
	Mean		3.691	3.806	3.942	3.811	3.947	3.837	3.596	3.921	3.963	3.879	3.785
	Std. Deviation		1.148	1.146	1.072	1.023	1.003	1.142	1.114	1.114	1.032	1.046	1.183
	Variance		1.320	1.315	1.149	1.048	1.008	1.305	1.242	1.241	1.067	1.096	1.401
From 11 years to 15 years	N	Valid	159	159	159	159	159	159	159	159	159	159	159
	Mean		4.000	3.805	3.974	3.899	3.924	4.257	3.547	3.899	3.981	3.893	3.673
	Std. Deviation		.9743	1.003	.8855	1.038	1.022	.8360	1.266	1.097	1.040	1.100	1.198

	Variance		.949	1.006	.784	1.078	1.045	.699	1.604	1.205	1.082	1.210	1.437
From 16 years to 20 years	N	Valid	54	54	54	54	54	54	54	54	54	54	54
	Mean		4.111	4.018	4.166	3.703	4.000	4.074	3.833	3.907	3.888	3.722	3.500
	Std. Deviation		.8165	.9613	.7950	.9640	.8902	.7734	.9466	.8958	1.075	1.122	1.111
	Variance		.667	.924	.632	.929	.792	.598	.896	.803	1.157	1.261	1.236
From 21 years to 25 years	N	Valid	18	18	18	18	18	18	18	18	18	18	18
	Mean		4.111	4.055	4.166	3.944	3.944	3.888	3.833	3.777	4.000	3.333	3.722
	Std. Deviation		.8323	.9983	.8574	1.109	1.055	1.078	1.150	1.165	1.137	1.188	1.319
	Variance		.693	.997	.735	1.232	1.114	1.163	1.324	1.359	1.294	1.412	1.742

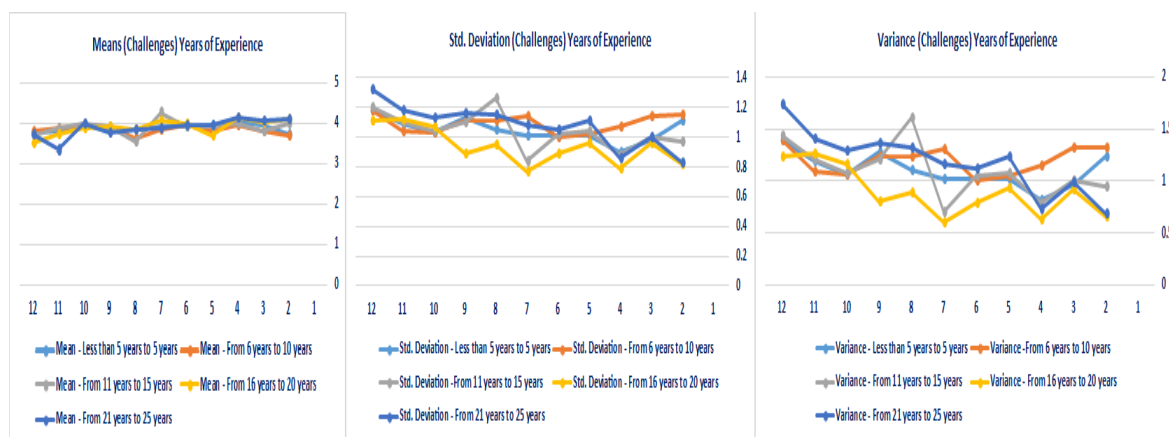


Figure 15. Shows mean scores and standard deviations related to number of years of experience and its relation with problem hindering faculty members from using electronic information resources centers.

Results from statistical analysis to data related to problems hindering faculty members from using information resources centers and its relation with number of years of experience indicated significant differences at ($\alpha \leq 0.05$), explained as follows. The mean score of participants of years of 5 years experience was (3.877) with standard deviation of (1.058) and a degree of variance at (1.117). The mean scores of participants of number of years of experience from 6-10 years was (3.834) with standard deviation of (1.071) and a degree of variance of (1.215). The mean scores of participants of number of years experience from 11-15 years was (3.895) with standard deviation of (1.038) and a degree of variance a (1.078). Mean scores of participants of number of years of experience from 16-20 was (3.902) with standard deviation of (0.985) and a degree of variance at (0.803) Mean scores of participants of number of years of experience from 21-25 was (3.888) with standard deviation of (1.068) and a degree of variance at (1.113).

The problems hindering faculty members from using electronic information resources centers in terms of investigation of participants' views are as follows: 'lack of encouragement of faculty members to use electronic information resources'; followed by 'lack of electronic information resources centers serving the university'; then, 'lack of specialized trainers to train faculty members in using electronic information resources centers'; after that, 'lack of an electronic learning environment equipped with technology and modern programs inside the university'; then, 'lack of appropriate places for electronic information resources centers and finally, 'lack of technical support to solve problems facing faculty members when searching electronic information resources centers.

DISCUSSION OF RESULTS

First hypotheses

Results related to this hypothesis show different effects to using electronic information resources centers for males and females since there are significant differences in favor of females in terms of importance of acquiring competencies needed to use electronic information resources centers, particularly these related to identifying a strategy for searching electronic databases, methods of documentation of data obtained on line, methods of identifying appropriate databases for particular area of specialization and use of specialized searching engines. These results are supported by the study of **Jain et al. (2012)**, that indicated effective employment of electronic information resources centers in providing the educational content at a wide range and identifying strategies to easily reach required information.

Results indicted differences between males and females in recognizing the nature of needs of faculty members. This is proved by the degree of variance in views of males that were higher than females. Results raise the importance of dealing with individual differences among students and meeting their needs in relation to study courses, allowing opportunities to self-learning, continuous support to teaching and learning, discovering the real aptitudes and potentials of learners, developing learners' abilities in reaching information from multi-resources and enriching learning process.

The study of **Gordillo et al. (2013)** supported the idea of identifying research skills, discovery skills, problem solving skills and learning from multi-resources electronic information. In addition to enabling faculty members to establish new educational units that facilitate learning through electronic information resources.

A number of studies revealed that there are many problems hindering the use of electronic information resources centers in the third world (**King & Boyatt 2015**). These match results from the current study as shown in the statistical analysis of data that revealed significant differences between males and females in the degree of variance of males in comparison to males... These results may go back to the lack of electronic information resources centers in some Saudi universities, lack of skills of using them, lack of specialized trainers and lack of encouragement. Participants suggested the importance of identifying an institutional strategy aims at providing resources and methods of effective use. Also it was suggested that relying on views of faculty members and making the utmost use of free Google applications for the success of research and teaching processes in terms of cost, easy management and achieving academic goals (**Davidson et al. 2013**).

Second hypotheses

There are significant differences among different academic ranks arranged as follows: lecturers, assistant professor, associate professor and professor. This is explained in terms of: the desire for identifying required electronic databases according to the academic area of specialization, documentation of references obtained on line, evaluation of search results, ability to use technical support and on line guide of topics and the possibility of using electronic information resources. That is assured by the study of **Davids et al. 2015** and **Basha et al. 2013**. The current study indicated the importance of helping lecturers and assistant professors in acquiring competencies of using electronic information resources centers as they are considered the most active members in the field of teaching and research.

Results indicated the needs of faculty members according to the academic rank as follows: associate professor- demonstrator- lecturer- assistant professor- professor. The degree of variance for assistant professors and professors were less than other academic ranks. The study of **Amjad et al. (2013)**, indicated that most researchers are in need of using electronic information resources centers for the purposes of teaching, researching, using and learning at the appropriate times and discovery of real aptitudes and potentials of learners. Views were variant regarding processes of preparation and implementation of lectures in addition to developing abilities of students in reaching information from multi-sources.

Results indicated significant differences among different academic ranks arranged as follows: associate professor- demonstrator- professor- assistant professor- lecturer. Variance in views shown in different responses of participants in terms of problems hindering them from using electronic information resources centers, lack of encouragements towards using these centers, lack of enough places for these centers, lack of technical support to help faculty members solving their problems and lack of skills of using these centers.

Third hypotheses

Area of academic specialization plays a great role in orienting the hypotheses regarding helping Saudi faculty members acquiring competencies of using electronic information resources centers. Results indicated significant differences at ($\alpha \leq 0.05$), level in favor of applied sciences specializations, followed by health sciences and finally humanities. Results from the current study agrees with results from the study of **Fahad et al. (2013)**. This indicated the need for identifying appropriate strategies for researching electronic databases, identifying particular methods for academic areas of specialization, searching methods and documentation of references obtained on line (**Feraru & Teodorescu 2009**).

Responses of questionnaire items related to needs of faculty members in using electronic information resources centers indicated the importance of developing research, thinking and problem solving skills to their students through teaching. Also the importance of providing them with skills enabling them to adapt and make use of competitive rapid developments in the field of information systems. These results agree with results from the study of **Henle (2008)**. As it showed significant differences at ($\alpha \leq 0.05$), level in favor of health sciences, followed by applied sciences and finally humanities. The current study is supported by the results from the study of **Solomou et al. (2015)** that indicated the importance of dealing with individual differences, fulfilling students' needs, discovery of real aptitudes and potentials of students, using and learning at the appropriate times were the most prominent results obtained. Also, the study of **Dalveren (2014)** goes in match with the current study in relation to needs of using electronic information resources centers.

The analysis of data related to problems hindering different academic areas of specialization from using electronic information resources centers indicated significant differences at ($\alpha \leq 0.05$), level in favor of health sciences, followed by humanities and finally applied sciences. The study of **Gordillo et al. (2013)** found out that electronic information resources centers play a vital role in the future of education, providing learning content at a wide range, overcoming problems hindering the use of these centers. Results from this study match the results of the current study as it indicated the lack of these centers, lack of skills of using them and lack of such centers to help particular areas of academic specializations came on top of all problems hindering faculty members using electronic information resources centers. In addition to lack of flexibility in using these centers in comparison to applied specializations and the inability to use them in terms of easy access. (**Taber and García-Franco 2010**).

Fourth hypotheses

Results from the current study revealed significance differences at ($\alpha \leq 0.05$), level among different number of years of experience in relation to the need of acquiring competencies of using electronic information resources centers. Number of years of experience from 21-25 came on top followed by 16-20, then 6-11, after that 10-15 and finally from 1-5. The most prominent reported competency was the ability of faculty members to use direct technical support, use of guide of topics on line and identifying strategies for searching electronic databases (**Caird & Lane 2015**). The current study also agrees with a British study to develop models for helping faculty members to acquire competencies and skills. This study resulted in identifying components of the main page of electronic database, entering electronic database using abbreviated names, recognizing different types of electronic databases and methods of arranging variables of searching electronic databases (**Yang et al. 2014**). Results from the current study revealed variance in views in terms of number of years of experience from 1-5, then 6-11, then 10 to 15. Results indicted significant differences at ($\alpha \leq 0.05$), level among different years of experience in terms of needs of faculty members in using electronic information resources centers as follows: from 20-25, followed by 11-15, then 6-10, then 16 to 20 and finally from 1-5. The need of using these centers, developing students ability to obtain information from multi-sources, discovering real aptitudes and potentials and allowing opportunities for self-learning were the most prominent and match with the study of **Casquero et al. (2015)**. This study aimed assessing needs of students for on line use of electronic information resources centers and its relationship with establishing persona information networks, using and learning at the appropriate times, helping in preparation and implementation of lecture, classifying and organizing electronic information to facilitate access to them.

Examining data related to the variable of number of years of experience in relation to problems hindering faculty members from using electronic information resources centers revealed significant differences at ($\alpha \leq 0.05$), level details are as follows: from 16-20 were on top followed by 11-15, then 21-25, variance in views were for years of experience, 6-10 and 20-25 and 1-5.

Results from the current study revealed that lack of encouraging faculty members of using electronic information centers agree with the study of **Peacock et al. (2013)**, as this study identified problems and obstacles related to developing thinking skills. The current study indicated that lack of specialized trainers to train faculty members in using electronic information resources centers was the most prominent obstacle, in addition to lack of an electronic educational environment equipped with technology and modern programs inside colleges of the university. Also, lack of these centers inside universities, lack of appropriate places inside the university and lack of technical support to solve problems of searching electronic databases (**King & Boyatt 2015**).

CONCLUSION

- Expanding the establishment of electronic information resources centers in new universities.
- Designing training courses to staff members in acquiring needed competencies and fulfilling their needs.
- Designing a plan for solving problems hindering faculty members from using electronic information resources centers.
- Examining the factual situation of using electronic information resources centers in Saudi universities
- Designing strategies for using electronic information resources centers.
- Designing training courses to prepare specialists to offer technical support to faculty members.
- Designing training courses to university students in using electronic information centers and ways of making use of them.

REFERENCES

- Abel, A., Lenne, D., Moulin, C., & Benayache, A. (2004, September). Using two ontologies to index e-learning resources. In *Web Intelligence, 2004. WI 2004. Proceedings. IEEE/WIC/ACM International Conference on* (pp. 549-552). IEEE, DOI:10.1109/WI.2004.155.
- Abouelenein, Y. A. M. (2016). Training needs for faculty members: Towards achieving quality of University Education in the light of technological innovations. *Educational Research and Reviews*, 11(13), 1180-1193. DOI: 10.5897/ERR2015.2377.
- Adnan, H. (2014). An Analysis of the Factors Affecting Online Purchasing Behavior of Pakistani Consumers. *International Journal of Marketing Studies*, 6(5), 133. ISSN 1918-719X E-ISSN 1918-7203. <http://conferences.ukf.sk/index.php/divai/divai2014/paper/view/1408>.
- Al-Busaidi, K. A. (2013). An empirical investigation linking learners' adoption of blended learning to their intention of full e-learning. *Behaviour & Information Technology*, 32(11), 1168-1176, DOI: 10.1080/0144929X.2013.774047.
- Amjad, A., Ahmed, S., & Naeem, S. B. (2013). Use of electronic information resources among research scholars in the Islamia University of Bahawalpur, Pakistan. *New Review of Academic Librarianship*, 19(3), 316-328, DOI: 10.1080/13614533.2013.829505.
- Andrews, J., & Eade, E. (2013). Listening to students: Customer journey mapping at Birmingham City University Library and learning resources. *New Review of Academic Librarianship*, 19(2), 161-177., DOI: 10.1080/13614533.2013.800761.
- Akaichi, J. (2014, April). Flexible View Definitions to Enhance E-learning Resources Availability. In *DIVAI 2014*.
- Basha, A. D., Umar, I. N., & Abbas, M. (2013, January). A Sight on the Use of ICT Resources for E-Learning in the Iraqi Higher Education Institutions (IHEI): A Framework for the Use of ICT in E-learning. In *2013 4th International Conference on Intelligent Systems, Modelling and Simulation* (pp. 327-330). IEEE, DOI:10.1109/ISMS.2013.59.
- Caird, S., & Lane, A. (2015). Conceptualising the role of information and communication technologies in the design of higher education teaching models used in the UK. *British Journal of Educational Technology*, 46(1), 58-70, DOI: 10.1111/bjet.12123.
- Casquero, O., Ovelar, R., Romo, J., & Benito, M. (2015). Reviewing the differences in size, composition and structure between the personal networks of high-and low-performing students. *British Journal of Educational Technology*, 46(1), 16-31, DOI: 10.1111/bjet.12110.

- Cegarra-Navarro, J. G., & Rodríguez, F. J. C. (2012). Factors affecting the use of an e-learning portal at university. *Journal of Educational Computing Research*, 46(1), 85-103, ISSN: ISSN-0735-6331.
- Chang, C. C., Jong, A., & Huang, F. C. (2012). Using electronic resources to support problem-based learning. *Journal of Educational Computing Research*, 46(2), 195-206, **DOI:** 10.2190/EC.46.2.e.
- Cornelius, S., & Gordon, C. (2009). Adult learners' use of flexible online resources in a blended programme. *Educational Media International*, 46(3), 239-253, **DOI:** 10.1080/09523980903135392.
- Dalveren, Y. (2014). Using e-learning in enterprise resource planning (ERP) training: a case study to assist curriculum designers in Turkey. *Procedia-Social and Behavioral Sciences*, 116, 1353-1357, **DOI:**10.1016/j.sbspro.2014.01.396.
- Dauids, M. R., Chikte, U. M., & Halperin, M. L. (2014). Effect of improving the usability of an e-learning resource: a randomized trial. *Advances in physiology education*, 38(2), 155-160, **DOI:** 10.1152/advan.00119.2013.
- Dauids, M. R., Harvey, J., Halperin, M. L., & Chikte, U. M. (2015). Determining the number of participants needed for the usability evaluation of e-learning resources: A Monte Carlo simulation. *British Journal of Educational Technology*, 46(5), 1051-1055, **DOI:** 10.1111/bjet.12336.
- Davidson, K. S., Rollins, S. H., & Cherry, E. (2013). Demonstrating our value: Tying use of electronic resources to academic success. *The Serials Librarian*, 65(1), 74-79, **DOI:** 10.1080/0361526X.2013.800630.
- Fahad, A., Hassan, Z., & Salman, Z. (2013, January). A study towards using E-learning based information technology resources for the development of students thinking skills in higher education. In *2013 4th International Conference on Intelligent Systems, Modelling and Simulation* (pp. 331-334). IEEE, **DOI:**10.1109/ISMS.2013.61.
- Feraru, S. M., & Teodorescu, H. N. (2009). SRoL-Web-based Resources and Tools used for e-Learning of Languages and Language Technology. *Icvi 2009 - Proceedings of the 4th International Conference on Virtual Learning*: 119-126.
- Gordillo, A., Barra, E., Gallego, D., & Quemada, J. (2013, October). An online e-Learning authoring tool to create interactive multi-device learning objects using e-Infrastructure resources. In *2013 IEEE Frontiers in Education Conference (FIE)* (pp. 1914-1920). IEEE, **DOI:**10.1109/FIE.2013.6685169.
- Hani, H., Hooshmand, H., & Mirafzal, S. (2013, April). Identifying the factors affecting the success and failure of e-learning students using cluster analysis. In *e-Commerce in Developing Countries: With Focus on e-Security (ECDC), 2013 7th Intenational Conference on* (pp.1-12). IEEE, **DOI:**10.1109/ECDC.2013.6556748.
- Hartnett, E., & Koury, R. (2012). Using Google Apps Through the Electronic Resource Life Cycle. *Collection Management*, 37(1), 47-54, **DOI:** 10.1080/01462679.2012.629600.
- Henle, A. (2008). Electronic resources (ER) librarians, usage data, and a changing world. *Collection Management*, 32(3-4), 277-288. **DOI:** 10.1300/J105v32n03_03.
- Hockings, C., Brett, P., & Terentjevs, M. (2012). Making a difference—inclusive learning and teaching in higher education through open educational resources. *Distance Education*, 33(2), 237-252, **DOI:** 10.1080/01587919.2012.692066.
- Hostager, T. J. (2014). Online Learning Resources" Do" Make a Difference: Mediating Effects of Resource Utilization on Course Grades. *Journal of Education for Business*, 89(6), 324-332, **DOI:** 10.1080/08832323.2014.905765.
- Hughes, H. (2013). International students using online information resources to learn: complex experience and learning needs. *Journal of Further and Higher Education*, 37(1), 126-146, **DOI:** 10.1080/0309877X.2011.644778.
- Jain, K., Wangikar, V., Shah, S., & Vidhate, A. V. (2012, January). Exploitation of the unused resources for e-learning using data grid. In *Technology Enhanced Education (ICTEE), 2012 IEEE International Conference on* (pp. 1-8). IEEE, **DOI:**10.1109/ICTEE.2012.6208636.
- King, E., & Boyatt, R. (2015). Exploring factors that influence adoption of e-learning within higher education. *British Journal of Educational Technology*, 46(6), 1272-1280, **DOI:** 10.1111/bjet.12195.
- Korobili, S., Tilikidou, I., & Delistavrou, A. (2006). Factors that influence the use of library resources by faculty members. *Library review*, 55(2), 91-105, **DOI:** 10.1108/00242530610649594.

- Lau, S. B. Y., Lee, C. S., & Singh, Y. P. (2015). A folksonomy-based lightweight resource annotation metadata schema for personalized hypermedia learning resource delivery. *Interactive Learning Environments*, 23(1), 79-105, **DOI:** 10.1080/10494820.2012.745429.
- Leibowitz, B. (2009). What's inside the suitcases? An investigation into the powerful resources students and lecturers bring to teaching and learning. *Higher education research & development*, 28(3), 261-274, **DOI:** 10.1080/07294360902839875.
- Levy, R., Dickerson, C., & Teague, J. (2011). Developing blended learning resources and strategies to support academic reading: a student-centred approach. *Journal of further and higher education*, 35(1), 89-106, **DOI:** 10.1080/0309877X.2010.540317.
- Lim, H., Lee, S. G., & Nam, K. (2007). Validating E-learning factors affecting training effectiveness. *International Journal of Information Management*, 27(1), 22-35.
- Marković, S., & Jovanović, N. (2012). Learning style as a factor which affects the quality of e-learning. *Artificial Intelligence Review*, 38(4), 303-312, **DOI:** 10.1007/s10462-011-9253-7.
- Moreno, A. R., Fernandez, L. M. M., & Montes, F. J. L. (2009). The moderating effect of slack resources on the relation between quality management and organisational learning. *International Journal of Production Research*, 47(19), 5501-5523, **DOI:** 10.1080/00207540802014692.
- Noguerón-Liu, S. (2014). Mobilizing learning resources in a transnational classroom: translocal and digital resources in a community technology center. *Learning, Media and Technology*, 39(4), 429-448, **DOI:** 10.1080/17439884.2014.937343.
- Norman, C. F., & Siminitus, J. (2006). Conversations with California Community College Librarians and Deans of Learning Resources Programs: Library and Learning Resource Program Issues and Network Applications. *Community & Junior College Libraries*, 13(2), 17-35, **DOI:** 10.1300/J107v13n02_05.
- Park, J. H., Lee, E., & Bae, S. H. (2010). Factors influencing learning achievement of nursing students in e-learning. *Journal of Korean Academy of Nursing*, 40(2), 182-190. doi: 10.4040/jkan.2010.40.2.182.
- Peacock, S., Gordon, L., Murray, S., Morss, K., and Dunlop, G., (2013). Tutor response to implementing an ePortfolio to support learning and personal development in further and higher education institutions in Scotland. *British Journal of Educational Technology*, 41 (5): 827–851, **DOI:** 10.1111/j.1467-8535.2009.00986.x.
- Pineda-Herrero, P., Quesada, C., & Stoian, A. (2011). Evaluating the efficacy of e-learning in Spain: A diagnosis of learning transfer factors affecting e-learning. *Procedia-Social and Behavioral Sciences*, 30, 2199-2203, doi:10.1016/j.sbspro.2011.10.428.
- Sidgreaves, I., Priestley, J., & Winders, R. (1987). Supporting changing patterns of teaching and learning: Plymouth Polytechnic Learning Resources Centre. *Programmed Learning*, 24(1), 7-16, **DOI:** 10.1080/0033039870240102.
- Solomou, G., Pierrakeas, C., & Kameas, A. (2015). Characterization of educational resources in e-learning systems using an educational metadata profile. *Journal of Educational Technology & Society*, 18(4), 246-260.
- Taber, K. S., & García-Franco, A. (2010). Learning processes in chemistry: Drawing upon cognitive resources to learn about the particulate structure of matter. *The Journal of the Learning Sciences*, 19(1), 99-142, **DOI:** 10.1080/10508400903452868.
- Taffs, K. H., & Holt, J. I. (2013). Investigating student use and value of e-learning resources to develop academic writing within the discipline of environmental science. *Journal of Geography in Higher Education*, 37(4), 500-514, **DOI:** 10.1080/03098265.2013.801012.
- Thompson, H. J., Belza, B., Baker, M., Christianson, P., Doorenbos, A., & Nguyen, H. (2014). Identifying and Evaluating Electronic Learning Resources for Use in Adult-Gerontology Nurse Practitioner Education. *Journal of Professional Nursing*, 30(2), 155-161, **DOI:** 10.1016/j.profnurs.2013.08.004.
- Tripp, D. (2003). Three resources for learning organizational change. *Educational Action Research*, 11(3), 479-486, **DOI:** 10.1080/09650790300200223.
- Wang, J. (2014). R&D activities in start-up firms: What can we learn from founding resources?. *Technology Analysis & Strategic Management*, 26(5), 517-529, **DOI:** 10.1080/09537325.2013.870990.
- Yang, X., Qiu, Q., Yu, S., & Tahir, H. (2014). Designing a trust evaluation model for open-knowledge communities. *British Journal of Educational Technology*, 45(5), 880-901, **DOI:** 10.1111/bjet.12083.

Yessad, A., Faron-Zucker, C., Dieng-Kuntz, R., & Laskri, M. T. (2011). Ontology-based semantic relatedness for detecting the relevance of learning resources. *Interactive Learning Environments*, 19(1), 63-80, **DOI:** 10.1080/10494820.2011.528888.

Using Facial Recognition Technology in Smart Attendance Application

Greg CROW

The American School in Japan, Tokyo Academics

Japan

18crowg@asij.ac.jp

Alec BLAGG

The American School in Japan, Tokyo Academics

Japan

18blagga@asij.ac.jp

Emil BALIAN

The American School in Japan, Tokyo Academics

Japan

18baliane@asij.ac.jp

Phong NGUYEN

The American School in Japan, Tokyo Academics

Japan

phong@tokyoacademics.com

ABSTRACT

We propose to use a facial recognition technology in a smart attendance application in order to make the attendance taking process more efficient. The conventional method, such as manual roll call, is inefficient and time consuming. However, with the application of facial recognition technology, the attendance taking process becomes automated and unobtrusive, thereby making it a smarter alternative to traditional methods. In this paper, we introduce an open source attendance taking program using OpenFace for the facial recognition module. We use a machine learning approach to build a classification model to identify a person's name from the unique facial features of an individual subject. In an experiment, we have verified the accuracy of the facial recognition module at 96.2% given our test using 50 subjects. The result is tolerable for a school/organization with a small number of users. This could be implemented within a classroom to assist administration through automating roll call.

INTRODUCTION

Attendance is a tedious but necessary part of lives, from calling roll at school or clocking in at work. The main problem with the process of taking attendance is that although it is cost-effective, it is extremely inefficient with time. While other methods, such as key cards and fingerprints, allow for more time-efficient methods of clocking in, fingerprinting machines are expensive and key cards can easily get lost or misplaced. This creates the need for an alternative to traditional methods of attendance taking that will not get lost and is inexpensive.

Facial recognition technology has been developed rapidly for the past few years. The computing power of machine, as well as the advance in the algorithm of artificial neural network, has made facial recognition a reliable technology which can be used as one of the alternative solutions for an attendance taking system. By using facial recognition we created a new application for cost-effective, efficient attendance taking that will serve as an upgrade to conventional methods of attendance taking.

In this paper, we introduce the way to utilize facial recognition technology in a smart attendance application. Our open-source code is available at <https://github.com/xphongvn/smart-attendance-system-ta>, for other developers to reuse and improve for their own use. The rest of the paper is organized as follows: First, we give an overview of the related work to facial recognition technology and smart attendance system. Second, we present our method to apply facial recognition module in the whole system. Third, we demonstrate how we set up experiments to verify the accuracy of the facial recognition module. And we give the results and discussion about the results. Finally, we give our conclusions on the system.

RELATED WORK

There are other facial recognition softwares, such as Facefirst [1] and OpenFace [2]. Facefirst has facial recognition software. However, the focus is mainly on surveillance and picture capturing, which is an application of facial recognition but not our desired effect. It does not have possible attendance taking capabilities [1]. There is also programs such as OpenFace. OpenFace can detect a face and into feature representations into usable data [2]. Therefore, it won't classify the name and use this information in an attendance system. By leveraging the open source code from OpenFace were able to constructed a smart attendance application on that source code that can utilize the resources from OpenFace and be a facial recognition program that successfully takes attendance.

Another work has used Bluetooth Low Emissions (BLE) as a smartphone system for checking attendance. By implementing this within a classroom the problems arise with having obstacles within the class that would dampen the signal of the BLE emitter, making potential reading inaccurate. Also, this system requires the student to own a bluetooth compatible smartphone, which is expensive. [5]

METHOD

Data Collection

In order to prepare the training data, a sample of pictures of various subject's faces should be collected. These sample pictures were taken by the user on a laptop computer webcam before the experiment began. These sample pictures are then put into OpenFace API and are stored in folders under the name of each subject. These pictures are used for building a SVM classification model, with names of each person as the label used to classify them.

Building the Facial Recognition Model

We built a classification model using a machine learning framework. The goal with this model was to reach an accuracy of 97.53%, based upon the number given for human level accuracy in by Cornell University on Surpassing Human-Level Facial recognition capabilities [4]. From raw image data of a person's face, we convert it into feature vector using neural network provided by OpenFace. Using the feature vectors, a Support Vector Machine (SVM) classification model was built to identify a person's name [3]. The flow is described in Figure 1. By using the implementation portion of our program, the system will take in all inputs within the camera's frame and try to identify a face. If the correct range is met for the two inner eye landmarks and the bottom of the lip landmark, a face is identified within the camera. Then our system will match all other landmarks to the face and compare that to the data previously stored (the sample of pictures taken earlier). Our system will then make 128 strings and compare those to the previously stored data and the percent of the matches between the new set of 128 strings and the old set is returned as the percent confidence and a name.

Training

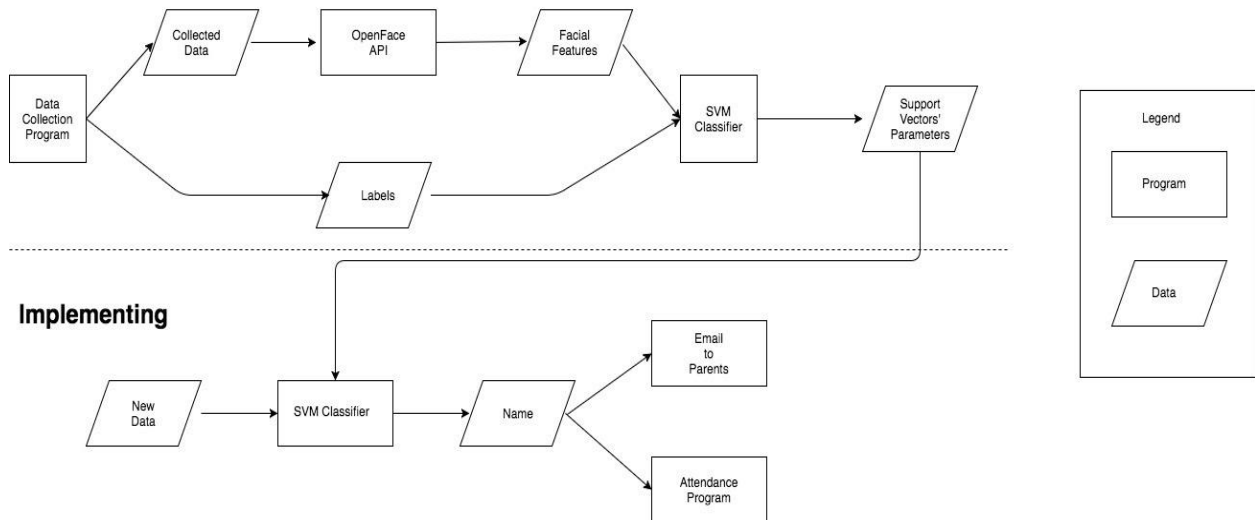


Fig. 1: Flowchart of training and implementation of Smart Attendance Application

Application

To know whether a person enters a building or leaves a building, we use 2 cameras: one facing the direction to enter, and the other one facing the direction to leave (Figure 2). The system will identify the person entering or exiting, and will then send their name to a processing program to mark their attendance. This system will be used by students to be identified for attendance, and management staff to monitor attendance. Also once a student is identified, the time of arrival and departure are recorded as well as their attendance marked (Figure 3). Simultaneously, an email will be sent to the student's parents to notify them if the student is or isn't present and the time of arrival and departure.

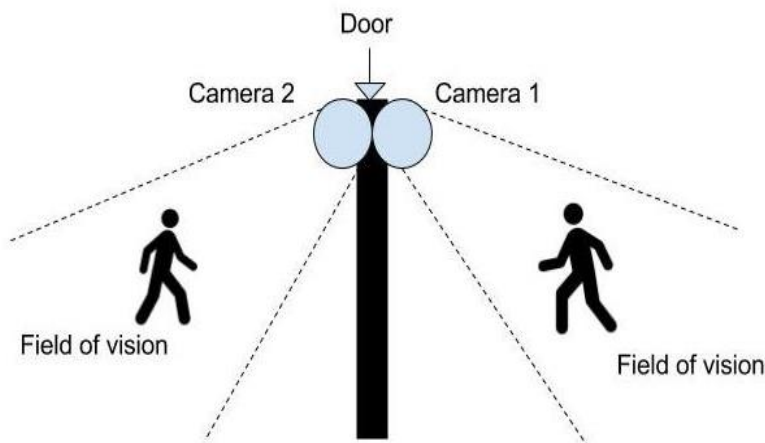


Fig. 2: Setup of smart attendance system, with cameras identifying people entering and exiting an area




Teachers		Students	
▼ Name	▼ Face	▼ Present	▼ Time in
Alec Blagg		<input type="checkbox"/>	N/A
Greg Crow		<input checked="" type="checkbox"/>	0:48
Emil Balian		<input type="checkbox"/>	N/A

Fig. 3: User interface of the Smart Attendance System

EXPERIMENTAL SETUP

The experiment took place at Tokyo Academics, a tutoring school in Japan, and spanned over the course of 2 weeks (2 weekends). This experiment was to verify the accuracy of the facial recognition module. We settled on an experiment that included a total of 50 subjects.

Before the start of the two weeks, each subject had 10 photos taken of them with the Facial Data Collection program, thus making profiles for each user which contained data on multiple characteristics of the user's face. The time to take 10 photos of the experimenters was not too long, therefore it was acceptable in the experiments. We believed the more training photos we had, the better the models can be built.

We used these collected photos and their names to build a SVM classification model. And the same SVM classification model was tested for accuracy. Over the course of the 2 weeks, each subject walked through the camera 10 times. We kept the lighting, camera level, and general walking speed of the test subjects as constants in order to truly test the accuracy of our system under fair conditions.

We setup the facial recognition module so that it shows the name of the person output by the system on top of their images. Fig 4. shows an example of how the module shows the image and the names on top of the image. We count the number of successful recognition (as the name of the person and the name as the system output is the same) as the main metric to verify the accuracy of the facial recognition module. The accuracy of the facial recognition module determine of reliability of our Smart Attendance System.

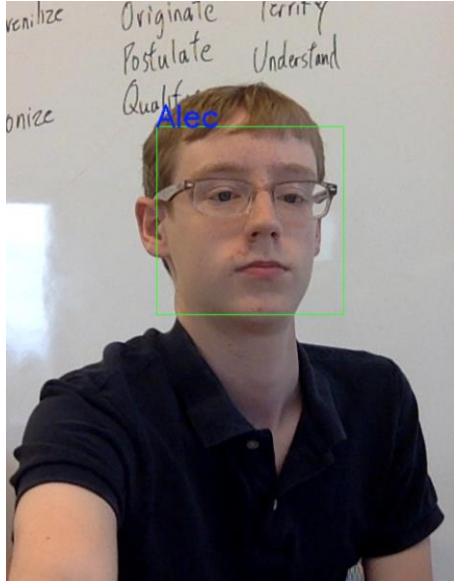


Fig. 4: Facial Recognition Module outputs a person name based on new input image

RESULTS

Of the 500 trials done 481 were accurately identified while 19 were incorrectly identified. This leaves us with approximately a 96.2% accuracy and a 3.8% error. Meaning that about 4 of every 100 students that come into TA will be incorrectly marked in one way or another. In the case of TA, this is a tolerable margin of error considering how few people this will affect. Extrapolating these results to a given company of or above 100,000 employees, there error appears to be at least 3,800 incorrectly marked people, also our SVM classifier can only work well with a small number of labels, or corporations of this scale, these two may potentially cause big problems for said corporations with large numbers of employees.

CONCLUSIONS

We have achieved an accuracy of 96.2% with our facial recognition module in our smart attendance system. However our experiment was not conducted on a larger scale because our SVM classifier can only work well with a small number of labels. Our future work is to improve the number of labels and improve the accuracy of the facial recognition module to be practical on a larger scale. This means that for this to be effective for real world applications, it would have to be used in a relatively small environment, examples including a small middle or high school, where the number of people needed to be identified is not as large, and where possible errors could easily be corrected by teachers. To employ this system in larger environment improvements would need to be made. These improvements could include the program generating a confidence percentage indicating how confident it is of its guess. This could be used to make it so that if the confidence is too low, the program would not return a name, but would instead alert of a stranger. This is as currently if an entirely new person were introduced to the program, it would identify it and give it a name, even if it can barely match the face, which could hurt our accuracy ratings. Other optimizations would be possibly changing the type of classifier used as because as was previously mentioned, our SVM classifier can only work with a small number of labels, limiting its ability to work on an even larger scale. In addition, our percentage of accuracy was slightly less that what our goal was, as we were trying for an accuracy of 97.53% and ended up with 96.2%. However, even if our model is slightly less accurate than human level, it is still very effective and can be more efficient than conventional methods of attendance. Finally, with improvements, such as returning a confidence number, or changing what we used for development of the model and the recognition, we feel that we could surpass our goal of 97.53% accuracy.

ACKNOWLEDGEMENTS

We would like to thank the Tokyo Academics staff, and Students who assisted in this project.

REFERENCES

- Face Recognition Software: Best-in-Class Enterprise Facial Recognition Security Platform. (n.d.). Retrieved September 20, 2017, from <https://www.facefirst.com/>
- Amos, B., Ludwiczuk, B., & Satyanarayanan, M. (2016). Openface: A general-purpose face recognition library with mobile applications. CMU School of Computer Science.
- Steinwart, Ingo. Support Vector Machines. S.l.: Springer., n.d. Print.
- Lu, C., & Tang, X. (2015, January). Surpassing Human-Level Face Verification Performance on LFW with GaussianFace. In AAAI (pp. 3811-3819).
- Chun, S., Kwak, M., Park, M., & Kwon, T. (2017, September 19). An Automatic Attendance Checking System using Smartphones: An Infrastructureless Approach. Retrieved September 20, 2017.

Using R in Conducting Multivariate Analyses Based on Data Summaries of Published Research

Mehmet TÜREGÜN

Curriculum and Instruction Department

Barry University, USA

mturegun@barry.edu

ABSTRACT

Most multivariate analyses use variance-covariance matrices and descriptive statistics, such as means and standard deviations, as their starting points. Inclusion of correlation matrices and descriptive statistics summaries in reporting results is recommended by journal editors and the American Psychological Association (APA) style guidelines. These descriptive data summaries in published research articles provide other researchers and graduate students in education and other social science fields with opportunities to replicate or verify the results of the analyses without requiring access to the raw data. The aim of this paper is to illustrate how to conduct various analyses, such as, multivariate analysis of variance (MANOVA), multiple regression, and factor analysis via R scripts based on descriptive summary statistics reported in published research.

Keywords: Multivariate analysis, Quantitative research courses, Teaching, Replication, R scripts.

INTRODUCTION

The important role that statistics plays in graduate programs in social science fields, such as psychology and education, is evidenced by increasingly common requirements for students to complete quantitative research methods courses in which the list of topics invariably includes univariate and multivariate statistical analysis techniques (Perepiczka, Chandler, and Becerra, 2011; Sandals & Türegün, 2013). Generally, Analysis of Variance (ANOVA), MANOVA, discriminant analysis, multiple regression, path analysis, and factor analysis are commonly discussed topics in these graduate research methodology courses. The use of variance-covariance matrices, correlations and standard deviations may be considered as the computational starting points for these types of analyses. Editors for various peer-reviewed research journals in education, educational psychology, social sciences, and the American Psychological Association (APA) style guidelines recommend the inclusion of correlation matrices, means, and standard deviations as descriptive data summary tables in the published articles. Additionally, as stated by Zientek & Thomson (2009), reporting correlation/covariance matrices, standard deviations, and means in published research articles allows researchers opportunities to conduct secondary analyses. Hence, this paper is focused on illustrating how to conduct various analyses by using these descriptive summary statistics tables in the published research articles as the starting point.

Conducting analyses based on the descriptive data summaries from published research in the fields of social sciences and education can be a very useful tool in teaching multivariate analysis for graduate students. From a pedagogical point of view, the opportunities offered by the secondary analyses, such as replication of published results, conducting secondary analyses leading to publishable outcomes, and developing transferable skills in coding syntax make this types of analyses ideal for use in classroom examples, semester projects, capstone research, and supplemental studies (Rossi, 1987; Sautter, 2014). Additionally, the reviews and editors of peer-reviewed journals may benefit from such analyses in their efforts to replicate and verify the reported results of statistical analyses conducted in submitted manuscripts.

The aim of this paper is to illustrate how to conduct multivariate analyses from the data summaries in published research, and discuss the possible issues and potential benefits of this practice for novice researchers and graduate students. In the next section, I present a brief description of the setting where I used these types of analysis based on data summaries.

MODEL AND PROCEDURE

The college of education at the university where I teach requires students to complete quantitative research methods courses, and I teach various research methods courses, including a multivariate analysis course. The multivariate course, titled Advanced Quantitative Inquiry, is a semester-long, face-to-face, doctoral level, multivariate analysis course taught by a single instructor for students within a college of education. The topics discussed in the course include inferential statistics and data analysis techniques for educational research and practice. Among the specific statistical techniques listed in the course objectives are factorial ANOVA, one-way and factorial MANOVA, multivariate analysis of covariance (MANCOVA), multiple linear regression, logistic regression, path analysis, and factor analysis. Additionally, students are provided with a comprehensive knowledge of R statistical computing environment and other statistical aids in order to complete various course assignments and projects. In addition to being included in a master's level research methods course, the univariate and bi-variate topics, such as descriptive statistics, inferential statistics, t-tests, one-way ANOVA, and bi-variate correlation, are also discussed further in a doctoral level pre-requisite course for the multivariate course.

In order to provide students with hands-on methodological experiences and applications of various multivariate statistical concepts and techniques, the assessment of the students' performances in the course is based on several components consisting of a dissertation critique, a peer-reviewed article critique, a number homework assignments, and a final research project report. For the peer-reviewed article critique assignment, students conduct literature searches in order to locate published articles using the multivariate techniques discussed in the course. The articles using multiple regression analysis, factorial ANOVA, MANOVA, MANCOVA, factor analysis, and path analysis techniques are the most frequently chosen types of articles by the students.

Following the APA guidelines and the American Educational Research Association (AERA) standards for reporting statistical analyses have been considered by many as essential practices for the replication of results (MacCallum & Browne, 1993; Maxwell & Cole, 1995; Onwuegbuzie & Combs, 2009; Onwuegbuzie, Combs, Slate, and Frels, 2009; Sandals & Türegün, 2013; Thompson, 2007; Zientek & Thomson 2009). Furthermore, reporting the sample variance-covariance matrix, and the descriptive summary statistics, such as means and standard deviations, along with the sample sizes provides sufficient information to allow readers to replicate the authors' results for certain types of correlational analyses, such as multiple regression analysis, factor analysis, path analysis, and structural equation modeling (Cohen, 1968; Rossi, 1987; Zientek & Thomson, 2009).

The journal articles chosen for the article critique assignment are examined closely to verify that sufficient amount of information is reported to permit the replication of the published results. Raw data are rarely included in published research articles. However, following the APA guidelines and AERA standards for publications, the authors of the articles usually report appropriate descriptive summary data for other researchers to replicate the results via secondary analysis.

Illustrated Examples

In this section, I give three examples selected by students to critique for a course assignment. The sources from which the examples were taken ranged from peer-reviewed journal articles to dissertations. The examples include multiple regression analysis, MANOVA, and factor analysis.

Multiple Regression Analysis (MRA) Example

In this example, a study focusing on the important and integral role that statistics play in research courses offered in graduate programs at schools of education was used to illustrate how MRA is implemented based on the summary statistics from published research studies. Perepiczka, Chandler, and Becerra (2011) investigated the nature and extent of the relationship among graduate students' *statistics self-efficacy*, *statistics anxiety*, *attitude towards statistics*, and *social support*. The data for these four variables were collected from a sample of 166 participants from various colleges of education across the United States. The descriptive statistics summary consisting of the means, standard deviations, and the Pearson product-moment correlations for the four variables is presented in Table 1.

Table 1.
Means, standard deviations, and correlations for the variables.

N=166	M	SD	Self- efficacy	Statistics Anxiety	Attitude towards Statistics	Social Support
Self-efficacy	49.73	18.97	1	-	-	-
Statistics	119.95	35.83	-.679	1	-	-
Anxiety						
Attitude towards Statistics	106.73	18.91	.708	-.832	1	-
Social Support	5.69	1.04	-.023	.006	.017	1

The data presented in Table 1 constituted the starting point in creating the R script given in Figure 2 to conduct a simultaneous multiple linear regression analysis. As can be seen from Table 1, *statistics anxiety* and *attitude towards statistics* were highly correlated ($r=-.832$). To combat multicollinearity, the problematic variable is either omitted from the analysis, or combined with the other variable(s) causing multicollinearity in order to create a single variable, especially for variables with correlation coefficients of .80 or higher (Stevens, 1992). However, since this strategy was not implemented by Perepiczka, Chandler, and Becerra (2011), it was not used here either in order to be able to compare the results.

Table 2.
Model summary and ANOVA results.

R	R-Square		Sum of Squares	df	Mean Square	F	p
.73	.53	Regression	31374.84	3	10458.28	60.5	.000
		Residual	28002.21	162	172.85		
		Total	59377.05	165			

A simultaneous multiple regression using the R script given in Figure 1 produced a statistically significant model to predict *self-efficacy* to learn statistics from *statistics anxiety*, *attitude towards statistics*, and *social support* ($F(3, 162) = 60.5, p < .001, R^2=.53$). As presented in Table 2, the three predictor variables combined together accounted for 53% of the variance in the *self-efficacy* to learn statistics.

As illustrated in Table 3, *statistics anxiety* was a statistically significant predictor of *self-efficacy* to learn statistics ($t(162) = -2.98, p < .01$). *Attitude towards statistics* was also a statistically significant predictor ($t(162) = 4.80, p < .001$). However, *social support* was not a statistically significant predictor of *self-efficacy* to learn statistics ($t(162) = -.54, p > .05$).

Table 3.
MRA results with Self-efficacy to learn statistics as the dependent variable.

	Standardized Coefficients Beta	t	p
StatAnxiety	-.29	-2.98	.003
AttStat	.47	4.80	.000
SocSupp	-.03	-.54	.590

The analysis based on the data summaries reported by Perepiczka, Chandler, and Becerra (2011) replicated their results and conclusions that *statistics anxiety* and *attitude towards statistics* were statistically significant predictors of *self-efficacy* to learn statistics, but not *social support*. The results of the analysis reported here using only summary statistics were aligned well with their results.

```
#Install and load the necessary packages and the associated libraries
library(psych);library(Rcmdr);library(FAiR)
#Read Lower Corr matrix as the input data file
cormat<-read.triangular("C:/Users/Mturegun/Desktop/R Dell/StatSlfEffcormat.txt",
  names=c("StatAnx","AttStat","SocSupp","SlfEffStat"),nlines=4)
#Display Correlation Matrix
cormat
#Perform MRA
set.cor(y=4,x=1:3,cormat,n.obs=166)
#or another way
set.cor(c(4),c(1:3),cormat,n.obs=166)
```

Figure 1. The R script for conducting multiple regression using descriptive data summaries as input.

MANOVA Example

In this example, a dissertation examining the effects of various student characteristics, such as ethnicity, family educational history, and native language, on academic self-efficacy, faculty-student interactions, and students' self-reported cumulative grade point average was used to illustrate how to conduct a one-way MANOVA based on data summaries. Among various multivariate analyses, Gosnell (2013) conducted a one-way MANOVA to examine the effects of enrollment status, as full-time versus part-time, on students' self-reported grade point average, academic self-efficacy, and faculty-student interactions. Table 4 illustrates the descriptive statistics and the Pearson correlations for the variables.

Table 4.

Means, standard deviations by full-time (FT) and part-time (PT) enrollment status, and correlations for Self-reported Grade Point Average (GPA), academic self-efficacy, and faculty-student interactions.

Variable	Enrolment Status FT M(SD)	Enrolment Status PT M(SD)	Self- reported GPA	Academic Self-efficacy	Faculty- student interactions
Self-report GPA	3.36(.436) n=92	3.18(.409) n=39	1	-	-
Academic Self-efficacy	7.50(1.60) n=75	7.47(1.63) n=31	.028	1	-
Faculty-student interactions	3.38(.54) n=88	3.07(.55) n=36	.123	.240	1

The descriptive summary statistics presented in Table 4 and the pooled standard deviations were used as a starting point in creating the R script given in Figure 3 to conduct a one-way MANOVA. The results, given in Table 5, were aligned with to the results reported by Gosnell (2013).

Table 5.

Multivariate Tests of Significance.

Test Name	Values	<i>F</i>	Hypoth. df	Error df	<i>p</i>
Hotelling's T^2	10.20	3.34	3	102	.022

There was a statistically significant effect of students' enrollment status on the linear combination of the variables, self-reported grade point average, academic self-efficacy, and faculty-student interactions, ($F(3,102)=3.34, p=.022$). As is illustrated in Table 6, subsequently conducted univariate ANOVAs revealed that the only statistically significant effect was for faculty-student interactions ($F(1,122)=8.33, p=.005, \eta^2=.064$) at the Bonferroni adjusted alpha significance level of .0167.

Table 6.

Univariate *F*-tests.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	<i>F</i>	<i>p</i>	Eta Square
Srgpa	.887	23.66	.887	.183	4.84	.030	.036
AcadSelf	.020	296.15	.020	2.588	.01	.929	.000
FacStInt	2.455	35.96	2.455	.295	8.33	.005	.064

As reported by Gosnell (2013), the full-time students ($M=3.38, SD=.54$) had statistically significantly higher faculty-student interactions than the part-time students ($M=3.07, SD=.55$).

```
#Install and load the necessary packages and the associated libraries
library(MASS);library(car)
#Calculating Two-group MANOVA from data summaries and var-covar group matrices
#Given means, SDs, and r coefficients for the four cells in a one-way two-group MANOVA
#Enter Means: m1DV1, m1DV2, m1DV3, m2DV1, m2DV2, m2DV3
m1DV1<-3.36; m1DV2<-7.5; m1DV3<-3.38; m2DV1<-3.18; m2DV2<-7.47; m2DV3<-3.07
#Enter SDs: sd1DV1, sd1DV2, sd1DV3, sd2DV1, sd2DV2, sd2DV3
sd1DV1<-.436; sd1DV2<-1.60; sd1DV3<-.54; sd2DV1<-.409; sd2DV2<-1.63; sd2DV3<-.55
#Enter Correlation coefficients:
cor1DV1DV2<-.028; cor1DV1DV3<-.123; cor1DV2DV3<-.240
cor2DV1DV2<-.028; cor2DV1DV3<-.123; cor2DV2DV3<-.240
#Enter Sample sizes for two groups
n1<-75; n2<-31
#Enter Number of DVs
p<-3
#Given the two group means for 3 DVs create mean vectors for two groups
m1<-matrix(c(m1DV1,m1DV2,m1DV3),3,1); m2<-matrix(c(m2DV1,m2DV2,m2DV3),3,1)
#Given the two group SDs for 3 DVs and r coefficients create var-cov matrices for groups
#Var-Cov Matrices Calculated from mean, SD, and Corr values
varG1<-matrix(c(sd1DV1^2,cor1DV1DV2*sd1DV1*sd1DV2,cor1DV1DV3*sd1DV1*sd1DV3,
               cor1DV1DV2*sd1DV1*sd1DV2,sd1DV2^2,cor1DV2DV3*sd1DV2*sd1DV3,
               cor1DV1DV3*sd1DV1*sd1DV3,cor1DV2DV3*sd1DV2*sd1DV3,sd1DV3^2),3,3)
varG2<-matrix(c(sd2DV1^2,cor2DV1DV2*sd2DV1*sd2DV2,cor2DV1DV3*sd2DV1*sd2DV3,
               cor2DV1DV2*sd2DV1*sd2DV2,sd2DV2^2,cor2DV2DV3*sd2DV2*sd2DV3,
               cor2DV1DV3*sd2DV1*sd2DV3,cor2DV2DV3*sd2DV2*sd2DV3,sd2DV3^2),3,3)
#Calculate the pooled sample covariance matrix
```

```
S33<-((n1-1)*varG1+(n2-1)*varG2)/(n1+n2-2)
#Calculate Hotelling T^2, the F-statistic, and the P-value
T2<-((n1*n2)/(n1+n2))*(t(m1-m2)%*%solve(S33)%*%(m1-m2))
Fstat<-((n1+n2-p-1)*T2)/((n1+n2-2)*p)
df1<-p; df2<-n1+n2-p-1
pvalue<-1-pf(Fstat,p,n1+n2-p-1)
print(paste("Hotelling T^2=",round(T2,4),"F=",round(Fstat,4),
"df1=",df1,"df2=",df2,"P-value=",round(pvalue,6)))
#Univariate ANOVAs to follow significant MANOVA from data summaries
library(rpsychi)
#For DV1: GPA
Means<-c(m1DV1,m2DV1); SDs<-c(sd1DV1,sd2DV1); Samplesizes<-c(92,39)
#Use ind.oneway.second from the rpsychi package:
results<-ind.oneway.second(Means,SDs,Samplesizes)
results
#p-value for the F-test
Ftest<-results$anova.table$F[1]
pf(Ftest,1,122,lower.tail=F)
#For DV2: ASE
Means<-c(m1DV2,m2DV2); SDs<-c(sd1DV2,sd2DV2); Samplesizes<-c(75,31)
results<-ind.oneway.second(Means,SDs,Samplesizes)
results
Ftest<-results$anova.table$F[1]
pf(Ftest,1,104,lower.tail=F)
#For DV3: FSI
Means<-c(m1DV3,m2DV3); SDs<-c(sd1DV3,sd2DV3); Samplesizes<-c(88,36)
results<-ind.oneway.second(Means,SDs,Samplesizes)
results
Ftest<-results$anova.table$F[1]
pf(Ftest,1,122,lower.tail=F)
```

Figure 2. The R script for conducting MANOVA by using descriptive data summaries as input.

Factor Analysis Example

In this example, a study focusing on the predictive ability of a set of institutional and student characteristics for retention rates of full-time, degree-seeking, first-time freshmen was used to illustrate the use of secondary analysis from data summaries. Scott, Velazquez, Türegün, and Wolman (2016) examined the relations among a set of predictor variables based on a sample obtained from the Integrated Post Secondary Education Data Systems (IPEDS) Data Center. Based on previous research studies, Scott et al. (2016) considered a total of sixteen institutional and student characteristics as variables from 233 institutions for a factor analysis in order to summarize the patterns of correlations among the observed variables.

The variables used to describe student characteristics for each institution were first semester average GPA, SAT 25th percentile score, percent of full-time students, percent of full-time, first-time, undergraduates receiving federal financial aid, percent of full-time, first-time undergraduates receiving Pell grants, percent of undergraduates over the age of 24, and percent of first-time freshmen receiving financial aid and living on campus. The variables used to describe institutional characteristics were grand total enrollment, student-to-faculty ratio, highest degree offered, degree of urbanization, academic support per full-time enrollment (FTE), net Instruction per FTE, selectivity, average net price for students receiving grants or scholarship aid, and percent of undergraduate FTE. The variables selectivity, degree of urbanization, and highest degree are based on the percentage of freshman applications that are accepted, the area where the institution operates and/or the geographical region where the institution is based, and the highest degree offered by the institution, respectively.

Scott et al. (2016) reported the descriptive statistics and the correlation coefficients, Pearson for continuous and Spearman for ordinal variables. The reported correlations were the starting point in creating the R script given in Figure 4 to conduct a factor analysis using Principal Axis Factoring (PAF).

The analysis conducted by using the script given in Figure 4 replicated the results reported by Scott et al. (2016). The sampling adequacy of items was determined via the Kaiser-Meyer-Olkin (KMO) measure, and the Bartlett's sphericity test was used for appropriateness of conducting a factor analysis. The KMO statistic is a summary of how small the partial correlations are for each pair of the variables. If the variables share common factors then the partial correlations should be small and the KMO should be close to 1.0, indicating extraction of distinct and reliable factors. A value close to 0 indicates that the sum of the partial correlations is large relative to the sum of the correlations, which would result in factor analysis to be inappropriate.

```
library(psych);library(Rcmdr);library(Hmisc)
corrmat<-read.triangular("C:/Users/Mturegun/Desktop/R Dell/Scottetaltcorrmat.txt",
  names=c1 ("SAT","GPA","Select","PerFT","TotEnr","AcadSup","NetInst",
    "PerFed","PerPell","PerO24","S2FRat","MPSwAid","HDeg","PerUgrad",
    "Urb","PerFinCam"),nlines=16)
KMO(corrmat); cortest.bartlett(corrmat,n= 233)
#Perform Parallel Analysis to identify the number of factors to retain
fa.parallel(corrmat,n.obs=233,fm="pa")
#Perform PAF with Varimax rotation
fa(corrmat,nfactors=5,n.obs=233,fm="pa",rotate="varimax")
#Perform PCA on corr matrix (instead of cov matrix, since scales are different)
Scottpcacor<-princomp(covmat=corrmat)
summary(Scottpcacor,loadings=T,digits=3,cutoff=.3,sort=T)
Eigenvals<-Scottpcacor$sd^2
Eigenvals
#Scree plot
plot(Scottpcacor)
```

Figure 4. The R script for conducting a factor analysis by using correlation matrix as input.

According to Kaiser (1974) and Cerny & Kaiser (1977), values greater than 0.5 are considered acceptable. Furthermore, values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great, and values above 0.9 are considered superb. As presented in Table 7, the results of the extraction yielded a KMO statistic of .729, thus indicating the sampling adequacy of items was satisfied via the KMO measure.

Table 7.

Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity.

Kaiser-Meyer-Olkin (KMO)		.73
Measure of Sampling Adequacy		
Bartlett's Test of Sphericity	Approx. Chi-Square	1935.06
	df	120
	p	.000

Bartlett's test of sphericity tests the null hypothesis that the original correlation matrix is an identity matrix, which indicates that all correlation coefficients are zero. Bartlett's test of sphericity produced a significant result ($\chi^2(120)=1935.06, p < .001$), verifying the appropriateness of factor analysis.

In factor analysis, communalities can be thought of as the squared multiple correlations for each of the variables that have been included in the analysis using the factors as independent variables and the variable as a dependent variable. It represents the proportion of variance of each variable that is explained by the factors. Initial communalities are the squared multiple correlation between a given variable and all other variables. The initial and extracted communalities are presented in Table 8.

Table

8.

Commonalities for the variables.

Variable	Initial	Extraction	Variable Name	Initial	Extraction
1 SAT	.790	.851	9 PerPell	.786	.806
2 GPA	.499	.519	10 PerO24	.717	.757
3 Select	.325	.131	11 S2FRat	.633	.712
4 PerFT	.726	.826	12 MPSwAid	.519	.552
5 TotEnr	.677	.819	13 HDeg	.467	.627
6 AcadSup	.588	.654	14 PerUgrad	.615	.718
7 NetInst	.664	.781	15 Urb	.201	.154
8 PerFed	.425	.381	16 PerFinCam	.485	.540

Note. SAT: SAT 25th percentile score, GPA: first semester average GPA, Select: selectivity, PerFT: percent of full-time students, TotEnr: grand total Enrollment, AcadSup: academic support per FTE, NetInst: net Instruction per FTE, PerFed: percent of full-time, first-time, undergraduates receiving federal financial aid, PerPell: percent of full-time, first-time undergraduates receiving Pell grants, PerO24: percent of undergraduates over the age of 24, S2FRat: student-to-faculty ratio, MPSwAid: average net price for students receiving grants or scholarship aid, HDeg: highest degree offered by the institution, PerUgrad: percent of undergraduate FTE, Urb: degree of urbanization, PerFinCam: percent of first-time freshmen receiving financial aid and living on campus.

The communality values in the extraction column of Table 8 represent the proportion of the variance by the extracted factors. These values ranged from .851 to .131, suggesting that most of the variables are moderately, in some cases strongly, related to the set of factors, with the exception of the variables Selectivity and Degree of Urbanization. These two variables did not seem to be well represented in the common factor space.

Table 9 presents the eigenvalues obtained with a PAF, and the total variance explained. In determining the number of factors to be retained, traditionally and most commonly used practice is to use either Kaiser's eigenvalue rule or Cattell's scree test. Kaiser's eigenvalue rule is the default option in most statistics packages.

Table 9.

Eigenvalues and total amount of variance explained.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.460	27.877	27.877	4.181	26.132	26.132
2	2.427	15.171	43.048	2.112	13.203	39.335
3	2.151	13.447	56.495	1.784	11.151	50.485
4	1.457	9.108	65.603	1.111	6.943	57.428
5	1.118	6.988	72.591	.641	4.006	61.435
6	.888	5.550	78.142			
7	.827	5.170	83.312			
8	.537	3.359	86.671			
9	.453	2.832	89.503			
10	.373	2.329	91.832			
11	.327	2.042	93.874			
12	.280	1.750	95.624			
13	.248	1.550	97.174			
14	.178	1.113	98.287			
15	.151	.943	99.231			
16	.123	.769	100.000			

Even though Kaiser's rule may be the most widely used decision rule for determining the number of factors to retain, Kaiser's rule has been shown to almost always severely overestimate the number of factors to retain (Zwick & Velicer, 1986). Despite its subjective nature in interpretation, Cattell's scree test has been shown to be much more accurate, but also tended to overestimate the number of factors. Applying Kaiser's rule to the eigenvalues presented in Table 9 suggests the presence of five factors, as the eigenvalues for these factors are greater than 1, with factors 5 and 6 being equally close to 1 from above and below, respectively. Factors 1, 2, 3, and 4 explained 27.88%, 15.17%, 13.45%, and 9.11% of the variance, respectively, with a cumulative total variance of 65.6%.

In addition to Kaiser's rule, the scree plot shown in Figure 4 was examined as a second criterion. The scree plot appears to indicate the presence of at least five factors and possibly up to six factors, as there is a slight drop after the fifth factor. As indicated previously, the use of scree plot in deciding on the number of factors to retain can be somewhat subjective, and tend to overestimate the number of factors to retain. Additionally, as illustrated in Table 10, the factor matrix revealed that there was only one item loading on Factor 5. Cattell's scree test and Kaiser's eigenvalue>1 rule show a five factor solution, but the Velicer MAP achieves a minimum of 0.05 with four factors. Hence, a four-factor solution seemed reasonable, as suggested by Scott et al. (2016).

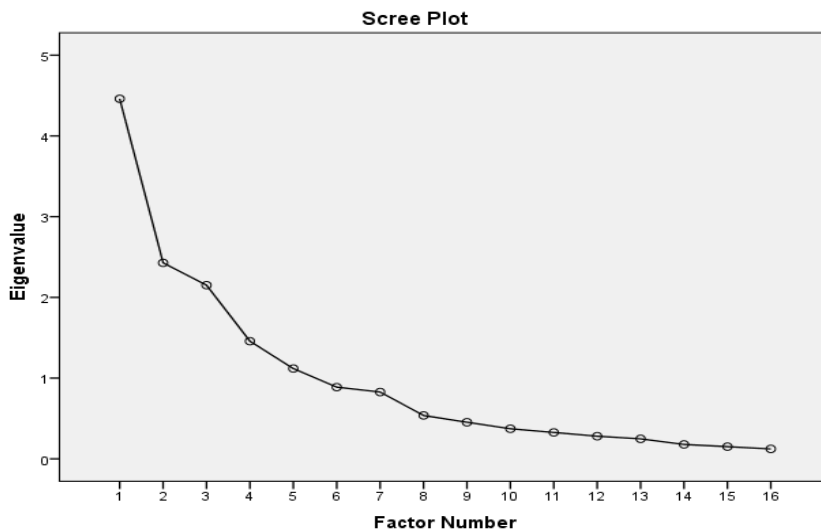


Figure 4. Scree plot

Factor 1, with the highest loadings of SAT, PerPell, and PerO24, seemed to focus on student characteristics. With high loadings of PerUgrad, and PerFT, Factor 2 reflected traditional enrollment. Factor 3, with the highest loadings of TotEnr, S2FRat, and MPSwAid was interpreted as institutional affluence by Scott et al. (2016). Factor 4, with the highest loadings of NetInst and AcadSup can be interpreted as Institutional academic support.

Table 10.
Factor matrix.

	Factor				
	1	2	3	4	5
1 SAT	.860				
2 GPA	.573			-.325	
3 Select					
4 PerFT	.512	-.619		.368	
5 TotEnr	.512		.721		
6 AcadSup	.562			.464	
7 NetInst	.623	.340		.505	
8 PerFed		.412	-.308		
9 PerPell	-.758			.416	
10 PerO24	-.650	.489			
11 S2FRat		-.570	.553		
12 MPSwAid	.444		-.523		
13 HDeg	.386	.322	.378		.454
14 PerUgrad	-.378	-.740			
15 Urb					
16 PerFinCam	.513		-.441		

CONCLUSIONS

There are many different purposes and benefits of replicating the results of various multivariate analyses via analyses based on published summary statistics, without relying on raw data. It may be an effective way for editors or reviewers to replicate the results of various multivariate analyses of submitted manuscripts to ensure and verify accuracy. These types of analysis of published research provide graduate students with opportunities and experiences that may lead to developing transferable skills in coding and statistical analysis. Integration of these pedagogical aspects into one's teaching approach makes these types of data summary-based analyses ideal for use in classroom examples, semester projects, and capstone research studies (Rossi, 1987; Sautter, 2014). Although R open source statistical computing environment was exclusively used in the examples given here, there are other data analysis packages to use, such as SAS, SPSS, Stata, OpenStat, and LISREL.

There are a several imitations of using data summary-based analyses. For example, insufficient data summaries and disregard for APA guidelines in reporting results prevent other researchers from replicating the results of published research. Descriptive data summaries reported in the published research can potentially be the starting point for the subsequent analyses to replicate the results. Therefore, making decisions about how to summarize the raw data becomes very important, and can further serve as a valuable teaching point. Although most multivariate analyses can be performed based on descriptive data summaries and correlation matrices, the information contained in the raw data is hardly ever recovered from the descriptive data summaries reported in the published research. Additionally, since the analyses based on published research use the data summaries, instead of the original raw data sets, as the starting point, novice researchers or graduate students do not have an opportunity to gain experience in or practice data screening or preparation techniques, such as handling of missing data, or verifying assumptions.

In closing, the analytics of understanding, processing, and visualizing data in order to extract valuable information from it is an important skill, not only at the professional level, but also at all educational levels from elementary school to college and beyond. Hence, it is time now to begin fully incorporating R into one's set of data analytics and statistical tools.

REFERENCES

- Cerny, C. A., & Kaiser, H. F. (1977). A study of a measure of sampling adequacy for factor-analytic correlation matrices. *Multivariate Behavioral Research*, 12(1), 43-47.
- Cohen, J. (1968). Multiple regression as a general data-analytic system. *Psychological Bulletin*, 70, 426-433.
- Gosnell, J. (2013). *Academic self-efficacy, faculty-student interactions, and student characteristics as predictors of grade point average*. Unpublished doctoral dissertation. Barry University.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39, 31-36.
- MacCallum, R. C., & Browne, M. W. (1993). The use of causal indicators in covariance structure models: Some practical issues. *Psychological Bulletin*, 114(3), 533-541.
- Maxwell, S. E. & Cole, D. A. (1995). Tips for writing (and reading) methodological articles. *Psychological Bulletin*, 118(2), 193-198.
- Onwuegbuzie, A. J., & Combs, J. P. (2009). Writing with discipline: A call for avoiding APA style guide errors in manuscript preparation. *School Leadership Review*, 4, 116-149.
- Onwuegbuzie, A. J., Combs, J. P., Slate, J. R., & Frels, R. K. (2009). Evidence-based guidelines for avoiding the most common APA errors in journal article submissions. *Research in the Schools*, 16(2), ix-xxxvi.
- Perepiczka, M., Chandler, N., & Becerra, M. (2011). Relationship between graduate students' statistics self-efficacy, statistics anxiety, attitude toward statistics, and social support. *The Professional Counsellor*, 1(2), 99-108.
- Rossi, J. (1987). How often are our statistics wrong? A statistics class exercise. *Teaching of Psychology*, 14(2), 98-101.
- Sandals, L. & Türegün, M. (2013). *A model for teaching research methodology for graduate students in social sciences and education*. Paper presented at the 20th International Conference on Learning. University of the Aegean, Rhodes, Greece.
- Sautter, J. (2014). Secondary analysis of existing data in social science capstone research. *Council on Undergraduate Research*, 34(4), 24-30.

- Scott, V., Velazquez, M., Türegün, M., & Wolman, C. (2016). *Predictors of college and university retention rates: A path analytic model*. Paper presented at Phi Delta Kappa (PDK) International Biennial Research Symposium. Barry University, Miami Shores, FL.
- Stevens, J. P. (1992). *Applied multivariate statistics for the social sciences* (2nd edition). Hillsdale, NJ: Erlbaum.
- Thomson, B. (2007). *Standards in conducting and publishing research in education*. Paper presented at annual meeting of the Mid-Western Educational Research Association (MWERA). St. Louis, MO.
- Zientek, L. R., & Thompson, B. (2009). Matrix summaries improve research reports: Secondary analyses using published literature. *Educational Researcher*, 38(5), 343–352.
- Zwick, W., & Velicer, W. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, 99(3), 452-442.

Using Technology Devices to Improve College Students' English Learning Outcomes

Ju Yin YANG

Kainan University

irenesandiego@mail.knu.edu.tw

INTRODUCTION

Nowadays, traditional classroom instruction combined with new tools using computer technology is making a dramatic contribution to various educational fields, including the learning of foreign languages, particularly in higher education (Chen, Chang, & Yen, 2012; MacDonald, 2006; Prensky, 2001; Author, 2015). New uses of computer technology have exploited the rapid technological changes in the educational system (Chen et al., 2012; Author, 2014). The 2015 *Higher Education Horizon Report* from the NMC (New Media Consortium) Project (2015) describes how integrating technologies has a positive impact on students' learning, instructors' teaching, and increased demand for using technology tools in higher education, for instance by increasing learning motivation, encouraging students to more actively self-manage their learning, and providing training to future workers (Hargittai, 2010; Rayson, 2013; Mohammadyari & Singh, 2015). Many educators have investigated which of the new technological tools may be most efficient to motivate college students' learning (Salas, Kosarzycki, Burke, & Stone, 2002; Schwabe & Goth, 2005). Colleges and universities have altered insofar as technology plays a role for teachers and students, as an "unbundled environment" (Dziuban & Moskal, 2011, p. 207), where everyone can learn without time and place limitation; in this context, Greenhow (2009) raised the issue of which methods to adopt directly in saying that "we still have a long way to go in understanding methods of effective practice" (p. 10). To address this issue, this paper aims to use the three latest methods of technology-enabled instruction (Norberg, Dziuban, & Moskal, 2011; Thomas & Thomas, 2012) in order to improve students' learning (Levine, Ferenz, & Reves, 2002) by developing the subskills necessary to provide students with a new awareness of a given learning approach and assisting them to navigate their social-communicative environment (Dziuban, Hartman, & Moskal, 2004; Kim, Ruechert, Kim, & Seo, 2013) and to develop real skills (Ali, Murphy, & Nadkarni, 2014; Slaouti, 2002) in preparation for the needs of their future workplaces.

REVIEW OF THE LITERATURE

Introduction to the Blended Learning Approach

BL is viewed as one of the top 10 trends in classroom delivery of content knowledge (Graham, 2004; Kiviniemi, 2014) with appropriate pedagogical methodologies in classroom settings (Graham, 2006). The term "blended learning" was first used in late 2003 by Sharma and Barrett (Whittaker, 2011). Banados (2006) defined blended learning as "a combination of technology and classroom instruction in a flexible approach... which can improve learning outcomes and/or save costs" (p. 534). BL in the classroom encompasses collaborative training opportunities for learners (Waterhouse, 2005; Sharma & Barret, 2007; Richardson, 2010; Kim et al., 2013; Solomon & Schrum, 2010) and provides the opportunity for students to track their own learning (Rooney, 2003; Waterhouse, 2005). Currently, in higher education institutes, learners are frequently encouraged to bring their own devices for learning in specific subjects or contexts (Pegrum, Oakley, & Faulkner, 2013; Kong & Song, 2015). Hence, learners can collaborate with others using their own devices to complete activities within the classroom (Al-Qahtani & Higgins, 2013; Wu et al., 2012); and these devices are also certainly used for learning outside the class environment (Chen & Huang, 2012; Hwang, Wu, Zhuang, & Huang, 2013). Martin and Ertzberger (2013) state that "there is an opportunity to leverage mobile technology to better support students not only in the classroom, but also as students navigate to the context of their learning" (p. 76). Furthermore, students can complete assignments collaboratively outside the classroom using computer-assisted learning tools (Dziuban, Moskal, Kramer, & Thompson, 2013). Through immersion in a BL environment, learners have no limitations with regard to time management or space for self-learning pace (Vaughan, 2007; Tai, 2012).

This is convenient for adult learners who have jobs, or families, or are unable to attend class regularly. In addition, due to their limited budgets, many colleges and universities are trying to save money on additional costs in schools. Thus, they often require administrative staff and faculty to use tablet devices for meetings and to conduct international conferences by virtual means. In addition, they encourage teachers to design online course materials that can be delivered using the technology instead of printing out all of the class materials and exams. Interestingly, Singh and Reed (2001) and Dziuban et al. (2004) identified similar advantages of using BL: (1) it improves learning effectiveness; (2) it extends learning and teaching reach; and (3) it reduces cost and time.

Significant Cases of Blended Learning in Higher Education

The blending learning approach is viewed as a bridge that connects the face-to-face classroom with online learning environments (Lee, Fong, & Gordon, 2013). Starting in 2000, for instance, the Massachusetts Institute of Technology (MIT) introduced the MIT TEAL (Technology-Enabled Active Learning) program to teachers and students. TEAL aims to create a collaborate learning environment, which is a functional platform that allows teachers to integrate lectures, course materials, problem-solving, and personal responses to students' questions. By 2005, this program had been piloted in MIT physics courses, and was found to improve on traditional teaching methods, enhance students' study effectiveness, actively participate in studies, and create a high-tech, highly interactive study environment featuring high levels of mutual assistance (MIT iCampus, 2015).

In May 2009, the Australian government announced the "Digital Education Revolution" (DER), which aims to effect a meaningful transformation of education to increase "leadership development—practical guidance; faculty ability—enrichment of teaching; teaching resources—strengthening digital teaching and studying, establishment of a new basis—the digital technology for a digital revolution in teaching." The main venue for DER was the University of Sydney. With this as a beginning, the government is hoping to pursue for a complete digital renovation at every level of the educational system. It was reported in 2010 that "Australia committed AUD 2.4 billion over seven years to help schools across the country integrate technology into the classroom" (p. 1).

At the National Institute of Education at Singapore's Nanyang Technological University, the only teacher-training body in the country, the message is that "every place is a learning area, with no constraints on time or space." During classroom study, students combine their school and personal lives using computer backpacks the size of a sheet of B4 paper, which they carry and use to engage in schoolwork outside of school time. Furthermore, in the classrooms, the instructor sets up five different contexts in the learning materials, including ones on campus life and social occasions. Students can learn in these authentic contexts through collaboration with their peers: Desks are installed with computers that have wide touch-controlled screens to which students can automatically link by placing their electronic backpack near the desk, a system that facilitates student communication, interaction, and small group work. While classroom activities are in progress, students can receive assignments transmitted to them by their teachers, involving tasks such as performing internet searches (Huang, Lin, & Cheng, 2010).

These noteworthy examples from three of the world's top universities, MIT TEAL, DER, and Singapore's Nanyang Technological University, demonstrate how BL is used to combine formal class lectures and technology. Technology-supported learning serves as a useful support for regular teaching materials and creates learning opportunities in real life contexts (Collis, 2004; Cottrell & Robinson, 2003; Orvis, Wisher, Bonk, & Olson, 2002). To exploit these benefits, technological devices have been widely integrated in higher education institutions globally. This study focuses on the following three research questions:

- (1) Does any significant learning improvement occur as a result of the use of face-to-face classroom instruction with mobile devices, e-learning platforms, or blended learning plus FormosaSoft Media Server?
- (2) What are the differences between learning a language through face-to-face classroom instruction and mobile devices, an e-learning platform, or blending learning plus FormosaSoft Media Server?
- (3) Do students view technology-enabled learning materials as a facilitator of future job preparation?

METHODOLOGY

Participants

The 61 participants in this study were undergraduate students from various departments at a private university in Northern Taiwan: the Department of Applied English ($n = 43$), the International Honors Program ($n = 6$), the Department of Tourism ($n = 6$), the Department of Law ($n = 2$), and the Department of Business ($n = 4$). The participants included 24 males and 37 females, and fell into two age groups: 16–20 ($n = 43$) and 21–25 ($n = 18$). The classes they were enrolled in were treated as intact groups, meaning that they could not be randomly assigned to the three treatment conditions: (1) Mobile Learning (M-Learning); (2) E-learning Platform; and (3) BFMS. The main reason for choosing this approach was that all students had been exposed to the “Learning in the Smart Campus E-Learning Project” and the “Smart Campus Mobile” environment since 2014, making them more familiar with the use of digital tools and mobile devices in their learning than other students. In order to help them acquire a full understanding of the e-learning platform, all participants in the e-learning group received an “E-learning Training Course” for three hours at the beginning of the class such as using VoiceTube, watching videos on YouTube, and learning with MIT OpenCourseWare (Table 1).

Table 1

Participant Numbers and Treatment Groups

Groups	Group A	Group B	Group C
	M-Learning	E-Learning Platform	BFMS
Number of Participants	21	20	20
Devices	Mobile phones	E-Learning Platform	FMS
Tools	Smartphones	Desktop computers, laptops	Cloud Education, MIT OpenCourseWare

Note: BFMS = blended learning plus FormosaSoft Media Server; FMS = FormosaSoft Media Server; MIT = Massachusetts Institute of Technology

Specialized Course Design for the Three Groups

There are two academic semesters each year at the participants’ university, each 18 weeks long; this course was one semester long. The regular time for each class was two hours per session, twice a week. Normal class size ranged from 15 to 25 students. In different classes, the basic course design was combined with each of three models (Mobile Devices, E-Learning Platform, and FMS; see Appendix A). The researcher designed a 16-week English course for each group. The three groups used the same textbook, materials, and activities, learned with a regular instruction time, and received the same amount of instruction time in using the technological tools in class. All classrooms throughout the campus had free Wi-Fi access, with one or two computers and a projector in each classroom. The three teachers used related activities designed by the researcher to prompt the use of the technological tools. In each class, participants were given just 20 minutes to use the mobile devices in order to complete assignments; BFMS participants were also required to use the technological tools to prepare content before the class. As this implies, they were also expected to have acquired the needed knowledge and identified problems before classroom instruction. In other words, for the BFMS students, the method of learning was more self-directed.

Instruments

This study used mobile learning, e-learning, and BFMS as pedagogical approaches in English reading courses to investigate ways of improving college students’ learning outcomes. After the various technological tools were used to facilitate students’ learning, four instruments were used to collect data. In order to assess their improvement: (1) A background information survey was administered to gather personal information about the participants; (2) To examine participants’ learning progress, the General English Proficiency Test (GEPT), designed by the Language Training & Testing Center, was administered at an intermediate level as a pretest and posttest; and (3) A questionnaire on students’ perceptions of whether and how computer technology devices prepared them for future jobs.

Quantitative data collection. Achievement tests (the GEPT) were administered both before and after the implementation of the three different treatments. The test took 45 minutes and included vocabulary, structure, fill-in-the-blank, and reading comprehension questions.

Data Analysis

When analyzing the quasi-experimental data using multivariate analysis of covariance (MANCOVA), the researcher used individual scores as a unit of statistical analysis, including both pretest and posttest data. The pretest was viewed as the dependent variable, the three treatments were fixed factors, and posttest scores were taken from all 61 participants. Descriptive information was analyzed using SPSS 16.

RESULTS

Learning Improvements

In order to answer research question 1, analyses of variance (ANOVAs) were used to examine learning improvement across the three groups. One-way analysis of variance was used to analyze the pretest scores and the posttest scores—mean scores, standard deviations, and F-values—as shown in Tables 2 and 3. Pretest scores revealed that there were no statistically significant differences among the three groups ($F = .643, p = .529$). This means that the three groups demonstrated similar levels of English proficiency before participating in the study. Compared with the posttest scores for the three groups (Tables 4, 5, and 6), these results demonstrate statistically significant differences for all three groups ($F = 10.951, p = .000$). Furthermore, the BFMS group ($M = 78.25, SD = 10.036$) scored higher than the other two groups, that is, the E-Learning group ($M = 76.09, SD = 8.129$) and the M-Learning group ($M = 66.80, SD = 6.074$). The BFMS group scored marginally higher than the E-Learning group. The mean score of the E-Learning group was significantly higher than the M-Learning group.

Table 2

Pretest Scores for the Three Groups

Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	95% Confidence Interval	
					Lower Bound	Upper Bound
M-Learning	20	43.4000	7.91667	1.77022	39.6949	47.1051
E-Learning	21	41.1905	4.91548	1.07264	38.9530	43.4280
BFMS	20	42.8500	6.43408	1.43870	39.8388	45.8612
Total	61	42.4590	6.47450	.82897	40.8008	44.1172

Note: M-learning = mobile device learning; E-learning = E-learning platform; BFMS = blended learning plus FormosaSoft Media Server

Table 3

One-Way Analysis of Variance of Pretest Scores for the Three Groups

	<i>M</i>	<i>df</i>	Mean Square	<i>F</i>	Sig.
Between Groups	54.559	2	27.280	.643	.529
Within Groups	2460.588	58	42.424		
Total	2515.148	60			

Table 4

Multivariate Tests of Performance Improvement of the Three Groups

Effect	Value	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	Sig.
Treatments (Wilks's λ)	.704	5.473	4.000	114.000	.000

Table 5

Tests of Between-Subjects Effects

Source Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Pretest	54.559	2	27.280	.643	.529
Posttest	1486.552	2	743.76	10.951	.000

Table 6

Summary of the Final Results of the Multivariate Tests

Sources	SSCP		df	Λ		F
	Pretest	Posttest		Pretest	Posttest	
Experimental	54.559	-158.084	58	.704	.643	10.951
	-158.084	1486.552				
Error	2460.588	327.969				
	327.969	3936.760				

* $p < .05$.

Differences in Using the Various Devices

To answer research question 2, differences in learning improvement between the three groups were assessed. They were as follows. First, interestingly, the E-Learning group achieved higher mean scores than the M-Learning group. From Table 7, the M-Learning group (min. = 28, max. = 62) and the E-Learning group (min. = 30, max. = 48) received closer mean scores in the pretest; after the experimental instruction, the M-Learning group (min. = 52, max. = 78) received lower mean scores than the E-Learning group (min. = 63, max. = 89) in the posttest. The pretest and posttest mean scores in the BFMS group were relatively low. In the posttest, the BFMS group showed greater improvement (min. = 52, max. = 91) than the other two groups (Table 7). This seems to indicate that providing a more real and interactive method of learning was improved learning performance more than other approaches.

Table 7

Comparing Minimum and Maximum Means of Pretest and Posttest

Groups	N	Pretest		Posttest	
		Min.	Max.	Min.	Max.
M-Learning	20	28	62	52	78
E-Learning	21	30	48	63	89
BFMS	20	30	53	62	91
Total	61	28	62	52	91

Future Job Preparation

To answer research question 3, the researcher summarized the students' perspectives on the influences of use of mobile technology for learning on their future job preparation. Twelve themes were collected from the questionnaire results (Table 8), consisting of the top four statements emphasized by each group. In the M-Learning group, students mentioned that using mobile devices for job preparation is a novel approach that makes those devices a new delivery tool ($n = 19$), in which employees can share company news and information, connect with social activities, and even hold new staff orientations using the mobile devices; also in the

M-Learning students' opinion, the devices can be used to discover information ($n = 19$), create long-distance business ($n = 19$), and that they make work more effective ($n = 19$); for the E-Learning group, important advantages were knowledge-sharing ($n = 19$), use as a new delivery tool ($n = 16$), gaining feedback quickly ($n = 16$), and enhancing interaction ($n = 16$). For the BFMS group, important factors were knowledge-sharing ($n = 18$), use as a new delivery tool ($n = 15$), training employees ($n = 16$), gaining feedback quickly ($n = 15$), and making work effective ($n = 15$). From the above, we can see that the findings of the three groups of students show agreement regarding the benefits of their BL approach in relation to future job preparation with regard to technology use, use as a new delivery tool, sharing knowledge, gaining feedback quickly, and making work effective. Overall, students desire the latest tools to deliver information not only in the learning environment but also in their future workplaces.

Table 8

Usage of Technological Devices in Future Job Preparation

Perspectives ($N = 61$)	M-Learning		E-Learning		BFMS	
	Yes	No	Yes	No	Yes	No
Knowledge-sharing	18	3	19	1	18	2
New delivery tool	19	2	16	4	15	5
Training employees	10	11	13	7	16	4
Discovering problems	19	2	10	10	12	8
Searching for information	18	3	8	12	9	11
Gaining feedback quickly	17	4	16	4	15	5
Long-distance business	19	2	15	5	12	8
Enhancing interaction	18	3	16	4	14	6
Tracking work procedures	17	4	11	9	12	8
Making work effective	19	2	12	8	15	5
Making work collaborative	12	9	14	6	11	9
Chance to interact with colleagues	18	3	11	9	10	10

DISCUSSION & CONCLUSION

To enhance reading comprehension while reading the course textbooks, watching YouTube or VoiceTube videos, and reading new articles posted on Facebook or discussion boards, students can also retrieve the latest learning contexts from the BFMS system based on students' English abilities. All students' experiences using technological tools in foreign language teaching and learning have been assessed for at least one academic year. This result complements the studies of Pasman and Woodward (2003) and Chen and Chung (2008) in which teachers provided a -world environment, immediate interaction, and 3D learning opportunities to learners, aiming to create pragmatic learning through technology usage. The study results suggest that mobile learning, e-learning, and BFMS can be widely used as instructional tools in language teaching and learning. The three kinds of learning tool tested each provided positive advantages to students' learning outcomes. Discussing the advantages of the three groups in detail, first of all, the M-Learning group saw a slight improvement. The use of mobile devices combined with the appropriate materials in class teaching and learning is expanding (Moredich & Moore, 2007; Lee, 2010). Students love to engage in class activities when teachers allow the use of mobile devices (Yang, Li, & Lu, 2015; Mittal, 2014; Zhang, 2013; Chen & Huang, 2012). Based on one of the Person surveys in 2014, most students desired to use mobile devices in the classroom (Poll, 2014). Furthermore, students interact more with their classmates during class by searching for materials or completing course assignments. Students like to capture pictures of their notes rather than writing them in notebooks.

During class, M-Learning students enjoy using their own devices to complete assignments. Most of the time, they share information, text messages, or email materials quickly using their tool.

The E-Learning group performed better than the M-Learning group in terms of learning outcomes. They were well able to read course materials and take quizzes repeatedly by themselves when ready. These self-learning activities benefited their acquisition of material. Most importantly, accompanied by video watching, it tends to enhance students' interest when reading long materials.

The use of BFMS caused more significant improvement than the use of either m-learning or e-learning. Providing the opportunity for acquisition of material among students is the main beneficial factor here (Hwang & Chang, 2011). Students in this group were expected to read materials before class, to prepare; then, while participating in class instruction, students are supposed to discuss, solve, and answer questions through group discussion. This approach makes it easier to communicate with classmates and understand the course materials. BFMS not only provides more opportunities for interaction among students but also allows extra time to absorb the materials. Biddix, Chung, and Park (2015) suggest that under this approach "students will be empowered to explore and take charge of their own learning beyond class time" (p. 162). Based on these results, it is important to note that BFMS not only encourages students to take advantage of self-learning time but also builds self-expression ability so that students can better express their perspectives.

Overall, one way to foster successful blended learning is teachers training students to perceive technology as a tool to improve learning outcomes. All students who participated in this study mentioned that their usage of technological devices increased gradually when the courses were taught. Each episode of technological device usage in learning is viewed as an improvement. Students have the opportunity to access their own devices, share information, and deliver messages. Students can benefit greatly from using mobile devices to learn. In the future, these discussions will help open the way for teachers and students in higher education who aim to use different technological tools in classroom teaching and learning.

Compliance with Ethical Standards

Informed consent was obtained from the study participants

REFERENCES

- Ali, A., Murphy, H. C., & Nadkarni, S. (2014). Hospitality students' perceptions of digital tools for learning and sustainable development. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 15, 1–10.
- Al-Qahtani, A. A. Y., & Higgins, S. E. (2013). Effects of traditional, blended and e-learning on students' achievement in higher education. *Journal of Computer Assisted Learning*, 29(3), 220–234.
- Biddix, J. P., Chung, C. J., & Park, H. W. (2015). The hybrid shift: Evidencing a student-driven restructuring of the college classroom. *Computers & Education*, 80, 162–175.
- Chen, C. C., & Huang, T. C. (2012). Learning in a u-museum: Developing a context-aware ubiquitous learning environment. *Computers & Education*, 59(3), 873–883.
- Chen, C. M., & Chung, C. J. (2008). Personalized mobile English vocabulary learning system based on item response theory and learning memory cycle. *Computers & Education*, 51, 624–645.
- Chen, I. J., Chang, C. C., & Yen, J. C. (2012). Effects of short-term memory and content representation mode on mobile language learning: A performance efficiency perspective. *Australasian Journal of Educational Technology*, 28(1), 122–137.
- Cottrell, D. M., & Robinson, R. A. (2003). Blended learning in an accounting course. *The Quarterly Review of Distance Education*, 4(3), 261–269.
- Dziuban, C. D., Hartman, J. L., & Moskal, P. D. (2004). Blended learning. *EDUCAUSE Center for Applied Research Bulletin*, 7, 1–12.
- Dziuban, C. D., & Moskal, P. D. (2011). A course is a course is a course: Factor invariance in student evaluation of online, blended, and face-to-face learning environments. *Internet and Higher Education*, 14, 236–241.

- Dziuban, C., Moskal, P., Kramer, L., & Thompson, J. (2013). Student satisfaction with online learning in the presence of ambivalence: Looking for the will-o'-the-wisp. *Internet and Higher Education*, 17, 1–9.
- Graham, C. R. (2006). Blended learning systems: Definition, current trends, and future directions. In C. J. Bonk & C. R. Graham (Eds.), *Handbook of blended learning: Global perspectives, local designs* (pp. 3–21). San Francisco, CA: Pfeiffer Publishing.
- Greenhow, C. (2009). Tapping the wealth of social networks for professional development. *Learning and Leading*, 36(8), 10–12.
- Hargittai, E. (2010). Digital na(t)ives? Variation in internet skills and use among members of the “net generation.” *Sociological Inquiry*, 80(1), 92–113.
- Huang, Y. M., Lin, Y. T., & Cheng, S. C. (2010). Effectiveness of a mobile plant learning system in a science curriculum in Taiwanese elementary education. *Computers & Education*, 54(1), 47–58.
- Hwang, G. J., & Chang, H. F. (2011). A formative assessment-based mobile learning approach to improving the learning attitudes and achievements of students. *Computers & Education*, 56(4), 1023–1031.
- Hwang, G. J., Wu, P. H., Zhuang, Y. Y., & Huang, Y. M. (2013). Effects of the inquiry-based mobile learning model on the cognitive load and learning achievement of students. *Interactive Learning Environments*, 21(4), 338–354.
- Kim, D., Ruechert, D., Kim, D. J., & Seo, D. (2013). Students’ perceptions and experiences of mobile learning. *Language Learning & Technology*, 17(3), 52–73.
- Kiviniemi, M.T. (2014). Effects of a blended learning approach on student outcomes in a graduate-level public health course. *BMC Medical Education*, 14, 47–53.
- Kong, S. C., & Song, Y. (2015). An experience of personalized learning hub initiative embedding BYOD for reflective engagement in higher education. *Computers & Education*, 88, 227–240.
- Lee, G., Fong, W. W., & Gordon, J. (2013). Blended learning: The view is different from student, teacher, or institution perspective. In S. K. S. Cheung et al. (Eds.), *Lecture notes in computer science: Hybrid learning and continuing education* (pp. 356–363). New York: Springer.
- Lee, M. C. (2010). Explaining and predicting users’ continuance intention toward e-learning: An extension of the expectation-confirmation model. *Computers & Education*, 54(2), 506–516.
- Levine, A., Ferenz, O., & Reves, T. (2000). EFL academic reading and modern technology: How can we turn our students into independent critical readers? *TESL-EJ*, 4(4).
- MacDonald, J. (2006). *Blended learning and online tutoring*. Aldershot, UK: Gower.
- Martin, F., & Ertzberger, J. (2013). Here and now mobile learning: An experimental study on the use of mobile technology. *Computers & Education*, 68, 76–85.
- MIT iCampus (2015). Learning without barriers. The Massachusetts Institute of Technology. Retrieved from <http://icampus.mit.edu/> Last updated, July 23, 2015.
- Mittal, R. (2014). Use of cell phone in classroom teaching: Boon or bane. *International Journal of Research*, 1(8), 1253–1257.
- Mohammadyari, S., & Singh, H. (2015). Understanding the effect of e-learning on individual performance: The role of digital literacy. *Computers & Education*, 82, 11–25.
- Moredich, C., & Moore, E. (2007). Engaging students through the use of classroom response systems. *Nurse Educator*, 32(3), 113–116.
- NMC Horizon Project. (2015). *2015 higher education horizon report*. Austin: New Media Consortium.
- Norberg, A., Dziuban, C.D., & Moskal, P.D. (2011). A time-based blended learning model. *On the Horizon*, 19(3), 207–216. doi:10.1108/10748121111163913
- Orvis, K. L., Wisher, R. A., Bonk, C. J., & Olson, T. M., (2002). Communication patterns during synchronous Web-based military training in problem solving. *Computers in Human Behavior*, 18(6), 783–795.
- Pasman, W., & Woodward, C. (2003). Implementation of an augmented reality system on a PDA. In *2003 IEEE and ACM International Symposium on Mixed and Augmented Reality ISMAR 2003* (pp. 276–277). Washington, DC: IEEE Computer Society.
- Pegrum, M., Oakley, G., & Faulkner, P. (2013). Schools going mobile: A study of the adoption of mobile handheld technologies in Western Australian independent schools. *Australasian Journal of Educational Technology*, 29(1), 66–81.

- Prensky, M. (2001). Digital native, digital immigrants. *On the Horizon*, 9(5), 1–6.
- Poll, H. (2014). *Person student mobile device survey 2014. National report: College students*. Retrieved from <http://www.pearsoned.com/wp-content/uploads/Pearson-HE-Student-Mobile-Device-Survey-PUBLIC-Report-051614.pdf>
- Rayson, S. (2013). Overview of Kineo & Elearning Age survey of developments in cooperative learning and technology: Ten key points and tasks for L&T departments. Retrieved from <http://www.slideshare.net/steveayson/learning-insights-2013-kineo-28218845>
- Richardson, W. (2010). *Blogs, wikis, podcasts and other powerful web tools for the classroom*. Thousand Oaks, California: Corwin Press.
- Rooney, J. E. (2003). Blending learning opportunities to enhance educational programming and meetings. *Association Management*, 55(5), 26–32.
- Salas, E., Kosarzycki, M. P., Burke, C. M., & Stone, D. L. (2002). Emerging themes in distance learning research and practice: Some food for thought. *International Journal of Management Review*, 4(2), 135–153.
- Schwabe, G., & Goth, C. (2005). Mobile learning with a mobile game: Design and motivational effects. *Journal of Computer Assisted Learning*, 21(3), 105–124.
- Sharma, P., & Barret, B. (2007). *Blended learning*. Oxford: Macmillan.
- Singh, H., & Reed, C. (2001). *A white paper: Achieving success with blended learning*. Alexandria, VA: American Society for Training & Development.
- Slaouti, D. (2002). The World Wide Web for academic purposes: Old study skills for new? *English for Specific Purposes*, 21(2), 105–124.
- Solomon, G., & Schrum, L. (2010). How 2, Web 2: How to for educators. Eugene, OR: *International Society for Technology in Education*.
- Tai, Y. (2012). Contextualizing a MALL: Practice design and evaluation. *Educational Technology & Society*, 15(2), 220–230.
- Thomas, M., & Thomas, H. (2012). Using the social media and web 2.0 technologies in business school teaching and learning. *Journal of Management Development*, 31(4), 358–367.
- Vaughan, N. (2007). Perspectives on blended learning in higher education. *International Journal on E-Learning*, 6(1), 81–94.
- Waterhouse, S. (2005). *The power of e-learning: The essential guide for teaching in the digital age*. Boston: Pearson.
- Wu, W. H., Wu, Y. C., Chen, C. Y., Kai, H. Y., Lin, C. H., & Huang, S. H. (2012). Review of trends from mobile learning studies: A meta-analysis. *Computers & Education*, 59, 817–827.
- Author (2014).
- Author (2015).
- Yang, X., & Li, X., & Lu, T. (2015). Using mobile phones in college classroom settings: Effects of presentation mode and interest on concentration and achievement. *Computers & Education*, 88, 292–302.
- Young, J. R. (2002, March 22). “Hybrid” teaching seeks to end the divide between traditional and online instruction. *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/Hybrid-Teaching-Seeks-to/18487>
- Zhang, L. (2013). Mobile phone technology engagement in EFL classroom. In *2013 International Conference on Software Engineering and Computer Science* (pp. 171–174). Amsterdam: Atlantis Press.

Appendix A

Specialized Course Design

Group	Main Procedures	Extra Functions for Learning
Group A	Lecture	In class:
	Task	Line
	Mobile Devices	YouTube video watching
		VoiceTube watching

Group B	Lecture	Adult learning activities: California
	Task	Distance Learning Project
	E-Learning Platform	Interaction tool: Facebook for social interaction
Group C		In class:
		YouTube video watching
		Adult learning activities: California
		Distance Learning Project
		Interaction Tool:
		In Time Discussion Board
Group C	Online Preparation	Outside class:
	In-Class Discussion	Read the materials online/download
	Online Reviewing	the assignments from MIT
		OpenCourseWare
		In class:
		Lecture, individual/group discussion
Group C		Outside class:
		Go online and review material
		Interaction tool: students' own devices

Using Timestamps for an Effective Utilization of Video Content and the Construction of its Platform

Shinya MIZUNO

Shizuoka Institute of Science and Technology

mizuno.shinya@sist.ac.jp

Masashi URAMATSU

Department of Healthcare Safety Management, Tokyo Medical University

masashi@tkf.att.ne.jp

Takahiro SOUMA

Chiba University Hospital

souma-ths@umin.org

Haruka OHBA

Shizuoka Institute of Science and Technology

1518115.oh@sist.ac.jp

Yoshikazu FUJISAWA

University of Shizuoka

fujisaway@myu.ac.jp

ABSTRACT

This research will use timestamps in order to measure the utilization of video content. A timestamp in this context refers to elapsed time since the start of the video, and it is linked to a viewer. By using this timestamp, the viewers are able to compare their own thoughts to the thoughts of others, thus enabling them to clarify their previously vague ideas in a relatively clear manner. We will also construct a platform where this timestamp can be utilized, and support wide-ranging utilization of video content.

INTRODUCTION

Today, universities within and outside of Japan are actively making their lectures accessible to the public. Platforms used for such purposes include Open Course Ware (OCW), which provides public access to lecture materials and lecture videos, and Massive Open Online Course (MOOC), which also offers learning support and certification. In recent years, an increasing number of universities are also using services such as iTunes U, YouTube, and Slide Share to make their lectures accessible to the public. While there are various challenges—such as the processing cost for editing public videos, copyright restrictions, and lack of departmental cooperation to increase the number of materials made available to the public (Takemura, 2012) (Yamazato, 2013)—public university lectures are growing steadily on such bases. While much focus has been placed on increasing website traffic and certification numbers, little attention has been paid to the analysis of individual public lecture videos. One reason for this could be the difficulty of video analysis.

While this calls upon the importance of big data analysis, analysis of video content is also underway. Mpeg-7 and video annotation have been highlighted as methods of analyzing unstructured data such as videos. Both technologies can automatically add information to videos and conduct efficient search within the video content. Although mpeg-7 has been an anticipated search technology for video data since 2002, it has not been used widely. Its complex input process, unstandardized video search methods and the availability of search tools on each search engine are thought to be the reasons behind this (Fujiki, 2012).

Likewise, key techniques of video annotation include video segmentation, in which a footage is divided into meaningful layers that are then annotated—a method in which specific rules are set and annotations are made when the footage matches the rule—and learning-based annotation (Nitta, 2009). However, a large-scale parallel programming environment, like Hadoop, would be required to use such techniques, and in many cases, only certain experts know how to operate it.

This research will use timestamps in order to measure the utilization of video content. A timestamp in this context refers to elapsed time since the start of the video, and it is linked to a viewer. By using this timestamp, as indicated in Figure 1, the viewers are able to compare their own thoughts to the thoughts of others, thus enabling them to clarify their previously vague ideas in a relatively clear manner.

Figure 1: Verifying the relative positioning of individual thoughts using timestamps

We will also construct a platform where this timestamp can be utilized, and support wide-ranging utilization of video content. Video content is expected to be used in a variety of fields, such as e-learning in education and medical care. Here, we will describe a case study from the healthcare industry.

PLATFORM FOR THE UTILIZATION OF VIDEO CONTENT

This research links timestamps to video content and measures the utilization of video content. This section will describe the basic design of the system required for this task. As demonstrated in Figure 2, this system can work in both e-learning format and face-to-face format. Devices used are personal computers and Android tablets. Here, we will provide explanations assuming the use of an Android tablet, which uses more technical components than using a personal computer.

Figure 2: The formats used in this system: e-learning and face-to-face format

First, the basic construction of database tables is indicated in Figure 3. The users table controls user login information and functions, and the content table controls information on video content. Additionally, the timestamps table controls each user's timestamps for the target video. Timestamp attribute table groups will be set up according to the number needed for a given target model.

Figure 3: Basic table construction used in this platform

Users of this system will be separated into users and administrators. Table 1 categorizes the functions used by users and administrators.

Table 1: The system's basic functions for users and admin

User	Administrator
Login function	General user functions
Viewing videos : entering timestamps	User, video management function : e-learning setting, etc.
Checking videos : timestamp display	Timestamp control function: aggregation level, etc.

Figure 4 describes the system flow concerning system users. Additionally, Figure 5 describes the overall system flow.

Figure 4: User system flow

Figure 5: Overall flow of the video content utilization platform

As shown on Figure 5, timestamps are recorded when the button is pressed during the first viewing of the video. Then, timestamp attributes are set for each model, and attributes are recorded by repeatedly viewing the video for the number of attributes.

Table 2 indicates technical components, which has a particular importance to the construction of this system. Additionally, Figure 6 indicates the utilization of a video tag, which superimposes timestamps onto the video, as well as the video distribution script for synchronized viewing of a video.

Table 2: Technical components used in the system

Item	Content
Visualization of video timestamps	Superimposing timestamps onto a video
Aggregation of video timestamps	Graphing timestamps
Android functions	User authentication from device
	Synchronizing video contents: Download function

Figure 6: Video tag and utilization of video distribution script

CASE STUDIES: APPLICATION OF THE PROPOSED PLATFORM IN MEDICAL FIELD

This section will introduce example cases that utilize this system. Within the medical field, in recent years, non-technical skills are increasingly recognized as being equally or even more important than technical skills in ensuring the safety of medical care. Especially in areas such as surgery and anesthesiology, progress has been made not only in the specific components of non-technical skills, but also in how they are assessed. However, on the other hand, a definitive method for the acquisition of non-technical skills is yet to be established. Particularly, as non-technical skills are characterized by the separation between “what one understands” and “what one does”, cramming knowledge through classroom learning is considered insufficient for the acquisition of non-technical skills.

Under such circumstances, there is an increased interest in the simultaneous utilization of simulation and e-learning as a potential method outside of knowledge acquisition. The use of simulation enables users to experience specific situations where non-technical skills are required, and through such an experience, there is the potential to go beyond simple understanding and to apply such requirement on a behavioral level. At the same time, the use of e-learning enables group decision-making and behavior analysis, regardless of one’s geographical environment.

Using the video content utilization platform, we develop a simulation system for non-technical skills acquisition targeting doctors in Japan and aim for its integration with e-learning. Furthermore, we verify its effects by conducting an experiment that actually uses the system.

The importance of simulation for non-technical skills acquisition

While the importance of non-technical skills (NTS) is increasingly recognized in the medical field (Souma, 2013) (Jones, 2014), at the moment, there is no clear method or approach established concerning how NTS should be acquired. Surely, in the medical field, components of NTS are gradually being defined, and it is becoming possible to study them as knowledge and to assess NTS in the actual clinical setting (Graafland, 2014). However, the biggest issue of NTS is that they differ from technical skills, and one’s knowledge and understanding of NTS may not link directly to his/her actual behaviors. Therefore, there is a need for an approach, which would enable one to apply such knowledge and understanding on a behavioral level while on site.

At present, the simulation approach has been identified as a potentially effective approach (Abrahamsen, 2014) (Network Rail, 2013). This is because simulation, by providing specific experiences, makes the importance of NTS tangible and facilitates such “recognition” in situations that require them (Morgan, 2011).

This is highly significant in that it uses the video content utilization platform and addresses the core of practical issues, such as “how does one acquire it” and “what approaches enable one to acquire it”, to indicate the outcomes.

Consequently, when doctors apply the specific approaches to NTS acquisition using this video platform, it could certainly enhance the safety of medical care. In addition, by developing such knowledge into NTS acquisition systems for other medical specialists in the future, NTS would be improved not only for medical care in Japan, but also for numerous medical specialists in the world. This is highly significant in that this will promote safer medical practices around the world.

Integration of the simulation system for NTS acquisition and e-learning

Previously, NTS were acquired by having participants assess NTS on paper, by listening to instructor's lectures and watching videos. Much of NTS assessment concerns assessment of human components. Therefore, it becomes challenging to determine what assessment is considered the standard, solely based on an individual's assessment. Furthermore, when assessments are conducted on paper, it takes time to get the aggregate and makes it difficult to capture the overall trend on the spot. Additionally, when participants are assessing the videos, there is no way to identify at what point in the video they sensed NTS. This takes away the opportunity to discuss "who felt what, during which scene".

Moreover, simulation for NTS acquisition is ideally conducted with an instructor in an operation room, etc., where the actual physical environment is in order. However, it is unrealistic to prepare such an environment given the cost and time limitations. Thus, an environment that makes use of e-learning, etc., becomes a necessity.

Here, we propose a simulation system for NTS acquisition, which uses the video content utilization platform and makes use of an e-learning environment. The following outlines the characteristics of this system:

1. A realistic, practical learning environment that uses NTS videos.
2. It enables participants to share their understanding of NTS with others and to verify their own ways of thinking.
3. It can be implemented regardless of location and start time. Furthermore, participants can arrange a time to carry out the training in real time.
4. Participants can assess NTS easily while watching the videos. By superimposing timestamps onto the videos, it enables precision in NTS debriefing (review learning).

Figure 7: An example of a video used in NTS simulation

Figure 7 is a scene from a video used for NTS simulation. These videos are created using scenes that have been selected by the authors as being effective for NTS education. While watching the video, participants can each record what they sensed by pressing a button. By sharing these timestamps with the group, they are able to share with each other "who felt what, during which scene", and objectively verify the NTS they picked up on. Figure 8 shows a list of timestamps entered by participants.

Figure 8: An example of a list of timestamps by participants

Table 3 describes the flow of the simulation system for NTS acquisition.

Table 3: Outline of the simulation system for NTS acquisition

System Name	Simulation system for NTS acquisition
Purpose	To support NTS acquisition through simulation
Preparation	Identify simulation videos Identify simulation participants
Flow 1	Participants login
Flow 2	Prepare for video distribution, Distribution begins
Flow 3	Video viewing, Individual NTS assessment
Flow 4	Overall NTS assessment
Supplementary notes	Tablets used as device Participants initially enter 4-category assessment stamps for the videos. Subsequently, they check the videos again and assess NTS. Participants can view everyone's assessment stamps during overall NTS assessment. The simulation videos can be viewed as e-learning (independent of location and time)

An example: Utilizing the simulation system for NTS acquisition

Using the proposed system, we implemented a practical training for NTS simulation assessment on October 12, 2015 at Business Centre Tokyo Station. There were 17 participants, including doctors. This session was carried out in a lecture format, rather than in an e-learning format. Table 4 indicates the flow of the session. Timestamp attributes used in the session include NTS categories (situational awareness, leadership, decision-making, and communication) and their assessment (4 levels), as outlined in Table 5. As indicated in Figure 9, this session will ask participants to select a NTS category at the time of recording a timestamp. Users will record a timestamp by selecting its attribute from the four buttons. Following this, users will view the video again and select an NTS attribute assessment, from Poor, Marginal, Acceptable, and Good for the timestamp they entered.

Table 4: Flow of NTS simulation

First video viewing	Watch the video as a group Select a NTS category at the time of entering a timestamp
Second video viewing	Watch the same video individually Enter an attribute (assessment of NTS category) for the timestamp
Third video viewing	Watch the video again as a group Go over timestamp assessments as a group, and review

Table 5: Timestamp attributes used in this session

Attributes	Content
NTS category attributes	Select one from situational awareness, leadership, decision-making and communication
NTS assessment attributes	Select one from Poor, Marginal, Acceptable, and Good

Figure 9: Category attributes at the time of timestamp recording

Next, all participants will watch the video for the third time and, as indicated in Figure 10, compare their individual assessment to that of the group. Additionally, as shown in Figure 11, we divided the video into time units, and graphed the number of timestamps at each instance. The sections with concentrated numbers of timestamps indicate where users were able to predict a component requiring an action. We expect that focusing on these sections during the debriefing would make it more effective.

Table 6 summarizes the number of assessments for each NTS attribute. Although the result also depends on the nature of videos, the trend shows that it is easier to give negative assessments. A preceding study in this field indicated a tendency for leadership to have low assessment values (Mizuno, 2015). By carrying out a debriefing in this system, we expect to see improvements in medical sites.

Figure 10: Review learning with use of video timestamps (Third video viewing)

Figure 11: Number of timestamps recorded at each time unit

Table 6: Number of assessments by NTS attributes

Assessment item	Poor	Marginal	Acceptable	Good
Situational awareness	2	7	3	0
Decision-making	2	6	3	0
Communication	3	16	11	0
Leadership	4	8	5	1

CONCLUSIONS

This research proposed a video analysis platform with timestamps. The use of this platform could create an environment that facilitates the analysis of videos –which is something that has not been studied extensively – and expands the range of its use.

We used the video content utilization platform and constructed a simulation system for NTS acquisition in order to improve non-technical skills in medical settings. We expect enhancements in NTS through the process of entering timestamps concerning the four categories while watching NTS videos and having each participant review the timestamps as well as assess them using a four-grade evaluation system. Additionally, by going over the assessments given by all participants, it enables individuals to understand their objective viewpoint concerning NTS. Furthermore, this system can be used for both real-time training and e-learning and is available to a variety of users. In the future, we will update the system in order to enhance NTS based on opinions from medical sites.

Utilizing the video analysis platform with timestamps, as proposed in this research, makes it possible to design a basic system that serves one's purpose. As this is a versatile platform, we expect that it can be applied to a variety of cases.

ACKNOWLEDGMENT

This research summarizes a part of the research outcomes in Grants-in-aid for Scientific Research Classification B, “Construction of an assessment system for non-technical skill in the domain of surgery in Japan” (principal researcher: Tomoyuki Goya).

We would like to acknowledge the support we received from Ms. Miki Shinohara of Shizuoka College of Technology for the overall model; Ms. Miyu Sawaki, Ms. Kiyoka Ikeda and Ms. Chihiro Tanaka of Shizuoka College of Technology for non-technical skills workshops; Mr. Shogo Iwamoto of Rexius Corporation and Mr. Daisuke Ogasawara of Wanko System Inc. for system construction; and Ms. Mutsumi Seki of Shizuoka University for proofreading this thesis.

REFERENCES

- Haruo Takemura. (2012). Osaka University Open Courseware, it's current status and future direction, Japanese Society for Engineering Education FY 2012 Engineering Education Research Lectures, Lecture papers (pp.720-721).
- Takaya Yamazato. (2013). Lectures in Nagoya University OCW that provide play and learning experiences, Japanese Society for Engineering Education FY 2013 Engineering Education Research Lectures, Lecture papers (pp.268-269).
- Fumihiko Fujiki. (2012). A study of annotation technique for practical use of MPEG-7, The Academic Reports, the Faculty of Engineering Tokyo Polytechnic University Vol. 35 No.1, (pp.63-70).
- Naoko Nitta. (2009). Keywords you should know Video Annotation, The Journal of The Institute of Image Information and television Engineers Vol. 63, No. 8, (pp.1113-1115).
- Takahiro Souma. (2013). Iryō anzen kara mita nontekunikaru sukuru O-sutoraria/nyu-ji-rando no gekai yōsē puroguramu kara mita gutaiteki na mondai kōdō [Non-technical skills from the perspective of medical safety – Specific examples of problematic behaviors observed in surgeon training programs in Australia and New Zealand], Journal of Clinical Surgery 68(7). (pp.764-72).
- de Vries, E. N., Prins, H. A., Crolla, R. M., den Outer, A. J., van Andel, G., van Helden, S. H., ... & Smorenburg, S. M.. (2014). Human-factors training for surgical trainees. Clin Teach. 11(3). 165-9.
- Graafland et al. (2014). Training situational awareness to reduce surgical errors in the operating room. Br J Surg. doi: 10.1002.
- Abrahamsen. (2014). Simulation-based training and assessment of non-technical skills in the Norwegian Helicopter Emergency Medical Services: a cross-sectional survey. Emerg Med J. doi: 10.1136.
- Network Rail. (2013). COSS Non Technical Skills: Toolkit.
- Morgan, P. J., Kurrek, M. M., Bertram, S., LeBlanc, V., & Przybyszewski, T. (2011). Nontechnical skills assessment after simulation-based continuing medical education. Simul Healthc. 6(5). 255-9.
- Shinya Mizuno, Yoshikazu Fujisawa, Masashi Uramatsu, & Takahiro Souma. (2015). Construction of an assessment system for Non-technical skill for surgeons and analysis, The International Conference for Production Research (ICPR23), (p.29).

Value-Based Interactive Multimedia Development through Integrated Practice for the Formation of Students' Character

Kokom KOMALASARI

*Faculty of Social Sciences Education,
Indonesia University of Education,
Bandung, Indonesia,
komalasari110@yahoo.com*

Didin SARIPUDIN

*Faculty of Social Sciences Education,
Indonesia University of Education,
Bandung, Indonesia,
kirimaya36@yahoo.co.id*

ABSTRACT

This study aims to describe the development of value-based interactive multimedia through integrated practice for the formation of students' character. This study uses Research and Development Design at the Department of Social Sciences Education at Indonesia University of Education. Conceptually, the design in question is integration of living values and social studies learning materials into interactive multimedia by involving students through an integrated practice in schools (university and junior high school). Implementation of the design is realized through several steps: negotiation of subject matter and character, presentation of materials, group distribution based on social science topics, exploration of character values according to the topics, integrated practice (initial observation to school, multimedia scenario development, multimedia production, multimedia simulations in class, and multimedia utilization in school). Implementation of the interactive multimedia design significantly affects the formation of students' character.

Keyword: interactive multimedia, value, integrated practice, character, student

INTRODUCTION

Higher Education as an educational institution responsible for shaping younger generation for future leaders holds a very strategic role in the formation of local wisdom-based character. According to Komalasari and Sapriya (2016) and Saripudin and Komalasari (2015) on the implementation of character education models in colleges and schools, it is necessary to cultivate methods of character education that meet the following characteristics: value-based education; college culture-based character education; and character education which involves aspects of "knowing the good, desiring the good/loving the good and acting the good" (Lickona, 1991). The above characteristics must be integrated into learning activities as core activities in college. This is in accordance with the format of character education developed by the Ministry of National Education (2010: 43), namely integration of character values in classroom learning activities in all subjects, which encompasses entire learning components, namely materials, methods, media, resources, and evaluation (Komalasari, 2010; Komalasari and Saripudin, 2015; Saripudin and Komalasari, 2016a). Thus, learning media is among the principal learning components.

In the global era, selection and use of media should consider the development of science and technology by heeding the values to nurture the character of students. A type of media that is viewed effective in learning is value-based interactive multimedia. Multimedia is a blend or a mix of two or more media formats such as texts, graphics, animations, and videos to integrate information into computer (Heinich et al, 2005; Vaughan, 2004; Mayer, 2009). Interactive multimedia is the use of a computer to blend texts, graphics, audio, moving images (video and animation) into a single entity with proper links and tools to enable users of multimedia to navigate, interact, create, and communicate" (Hofstetter, 2001). Interactive multimedia exhibits these characteristics: displaying more than one converging media, interactive, and independent (Munir, 2012; Sutopo, 2003).

Utilization of multimedia in learning serves as a possible solution to enhance the quality of learning in class, and as a viable alternative to overcome the limitations of teachers in teaching (Daryanto, 2010). In addition, multimedia in learning functions as a facilitator, a transmitter, a connector, and others. Multimedia in learning may allow the communication process to be more effective in order to reach the desired goal, i.e. changes in students' behavior (Munadi, 2008).

Instructional multimedia should involve students in its creation and utilization, so as to elevate students' creativity. It can also empower students in active learning. Institutes of teachers' education offer a specific course of Instructional Media and Information Communication and Technology (ICT). In this course, instructional multimedia should be developed and implemented as part of students' project through integrated practice. This means that the students establish their own instructional multimedia to be presented in class, which later can be applied in teaching practicum in school.

Therefore, a Research and Development-based study on a modest scale to produce a value-based interactive multimedia integrated practice assumed to effectively nurture students' character is called for. This type of model will be developed in the course of "Instructional Media and ICT in Social Science Education" at the Department of Social Sciences Education and its application will be integrated into teaching practicum in school.

This study aims to describe the development of value-based interactive multimedia in teaching social science education through integrated practice and its impact on the character formation of students. In particular, this study aims to describe: i) a conceptual model of value-based interactive multimedia through integrated practice for the formation of students' character; ii) its implementation; and iii) its impact on the character formation of students.

RESEARCH METHODOLOGY

This research was conducted using Research and Development Design (R&D) of Borg and Gall (1989). The method used is an explorative method to discover a model and an experimental method to test the model. Subjects were students of the Department of Social Science Education at Indonesia University of Education in the course of Instructional Media and ICT in Social Science Education academic year 2016/2017, totaling 92 people: 50 students of the experimental group and 42 the control.

Data collection instruments used in this study include: (i) observation sheets (ii) documentation study; (iii) focus group discussion; and (iv) questionnaires. Borg and Gall's (1989) model is adapted and modified into four stages, namely: 1) a preliminary study; 2) preparation of a conceptual model; and 3) validation and revision of the model; and 4) implementation of the model.

Qualitative data analysis is carried out through the following steps: (1) data reduction by summarizing reports, noting the key points that are relevant to the research focus; (2) systematic data organization based on specific categories and classifications; (3) data display in the form of tables or graphics so that the relationship among the data is clear and coherent; (4) cross-site analysis by comparing and analyzing the data in depth; and (5) presentation of the findings, drawing conclusions in the form of general trends and the implications of its implementation, and recommendations for the development (Fraenkel and Wallen, 2006). Quantitative analysis is performed through attitude scale by using two different tests of mean/gain score (Shadish, et.al:2002).

RESEARCH RESULTS

The conceptual model of value-based interactive multimedia development through integrated practice

Value-based interactive multimedia in social science education is integration of the values of life and social studies learning materials into interactive multimedia by involving students through an integrated practice in college and school. In light of this, a number of developmental principles emerge.

1. Developing core competencies and basic competencies in the social studies curriculum of 2013 and developing the values of character, unearthed through "contract of character" at the beginning of the semester.
2. Developing principles of living values education (Tillman, 2004: xv; Yunianto, 2009) which include: undertaking reflection, imagining widely, training relaxation and focus, expressing artistic creation, cultivating social skills, enhancing cognitive awareness about justice, nurturing social harmony, and gathering cultural values.
3. Applying the principle of interactive multimedia development. The interactive multimedia concept under examination combines and synergizes all sorts of media consisting of texts, graphics, audio, video, and interactivity (Green & Brown, 2002). Interactivity is designed to enable a person (student) as a user to access various forms of media as a new way to present and share group work so as to provide motivation and satisfaction for the students. Among the media types integrated into multimedia are texts, pictures/photographs/posters, animations, videos, and list of Value Clarification Technique (VCT) in a single power point material. Each media has the following contents:
 - a. Texts, containing facts, data, concepts, principles, procedures, and values-moral norms (living values);
 - b. Pictures, photos, posters, comics, used as a stimulus to clarify learning materials and values;
 - c. Graphs, charts, and diagrams, used to present data issues/problems/phenomena that exist in the real life;

- d. Animation, in the form of audio-visual media that contains cartoon stories packed with interesting, rich, and conflicting values, and stimulates students to think, clarify, reflect and apply the values of life;
- e. Sounds, intended to give effect to make the material more attractive and easy to understand;
- f. Learning material videos, containing clarification of learning material in the form of facts, data, concepts, principles and procedures presented in the form of video lessons;
- g. Video reflection, in the form of audio-visual media which contains a movie about the phenomenon in everyday life that motivates students to apply the values of life;
- h. VCT List, containing a list of symptoms in the form of behavior statements and how the frequency of such behavior is applicable in everyday life, along with the rationale for the application of such behavior.

Interactivity involving some of the above components facilitates students as teacher candidates to make a power point that integrates a mix of media types (multimedia) that have been selected and developed. Value-based multimedia interactivity can be seen in figure 1.

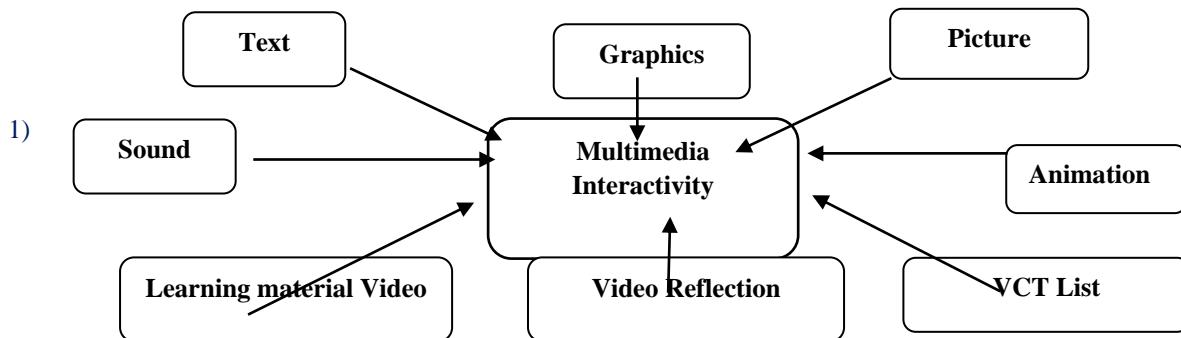


Figure 1: Interactivity as the Center for Multimedia Applications

The development of value-based interactive multimedia in instructional media and ICT in social science education is to:

- a. foster capacities of social science student teachers in analyzing core competencies, basic competencies, indicators, and materials to be developed into a more appropriate and effective instructional media in achieving social science competences (social knowledge, social attitudes, and social skills) of the students;
- b. assist student teachers in establishing the criteria of value-based instructional media in accordance with the material to be covered.
- c. assist student teachers in choosing various types of media combined into a multimedia (texts, pictures/ photographs/posters, animations, videos, and VCT-list) in a single power point material.
- d. assist student teachers in making a power point that integrates a variety of media (multimedia) that have been selected and developed. The power point is then burned into a Multimedia CD per subject matter.

4. Applying the integrated practice

Practical integrated activities refer to an experience-based curriculum prepared with the motivation and experience of students involved in a particular activity. Practical integrated activities are defined as an integrated practicum activities, where the integration is performed through interactive multimedia production practices in classrooms in colleges and in schools. With the experience gained from the practical integrated activities, students' desire to investigate the use of media in real terms in schools, the operational capability of value-based interactive media, and of course students' knowledge-attitude-social skills is developed simultaneously, comprehensively, and an integrated manner. This practical integrated approach blends project-based learning model and work-based learning in lectures.

Implementation of Value-based Interactive Multimedia through Integrated Practice

Following are measures in developing interactive multimedia through integrated practice in Instructional Media and ICT of Social Science Education:

1. Negotiation of Subject Matter and Character

At the first meeting, students and faculty brainstorm the instructional material to be studied and learning strategies to be implemented as well as the assessment systems. In addition, characters to be developed in the classroom are clarified and agreed upon. Results of the negotiation of subject matter and character are then formulated into classroom manuals that will serve as a joint commitment among the teacher and students.

2. Presentation of instructional media about social studies learning and life values.

At several meetings, learning materials related to instructional media and ICT in social science education will be presented according to the syllabus and lecture reports.

3. The class is divided into 12 groups on the basis of the topics of social science education of junior high school with regard to the core competencies and basic competencies in social studies curriculum of 2013.
4. Exploration of life values based on the social science topics in line with the curriculum of 2013, which include religious and social values.

5. Integrated Practice

Integrated practice integrates theory and practice in making the media, as well as classroom lectures with practice in schools. Steps under integrated practice activities include:

- a. School observation, whereby students make observations in social studies teaching in school, with a focus on its instructional media and its utilization in learning. In this activity, students together with the teacher explore the various types of learning media, problems in the construction of instructional media, and the solution.
- b. Developing value-based interactive multimedia. In this activity, students integrate the social science learning material with values of life into interactive multimedia. Through project-based learning, students generate products in the form of learning scenarios by utilizing interactive multimedia and developing interactive multimedia based on values in accordance with the relevant topics and subtopics, core competencies and basic competencies in the curriculum of 2013.
- c. Teaching simulation by using value-based interactive multimedia. This is done through the following steps: i) describing the learning scenario; ii) presenting the learning materials using the prepared multimedia; and iii) exploring and clarifying the values extracted from the learning material presented in the interactive multimedia. This simulation process of teaching is reviewed by another student assigned as an observer.
- d. Review of the simulation is undertaken by the lecturer. At the end of the interactive multimedia presentation, the lecturer provides clarification and review of the student's presentation. The review includes evaluation of the learning scenario, presentation/simulation of interactive multimedia, and interactive multimedia content (creativity, appropriateness of the content with the purpose, and clarity of the message), as well as a wealth of values in interactive multimedia.
- e. Reflection on life values (character). The lecturer together with the students reflect on the values of life embedded in the interactive multimedia that the presenting group is exhibiting. In this respect, the lecturer and the students explore, clarify, internalize, and create an action plan regarding the application of values in everyday life in a family environment, campus, community, and the country.
- f. Implementation of value-based interactive multimedia in teaching social studies at school by involving teaching practicum students by way of work-based learning. The interactive multimedia the students developed is then utilized in the teaching practicum process in school in order to enhance the quality of social science learning.

Developing value-based interactive multimedia through integrated practice can be seen in figure 2.

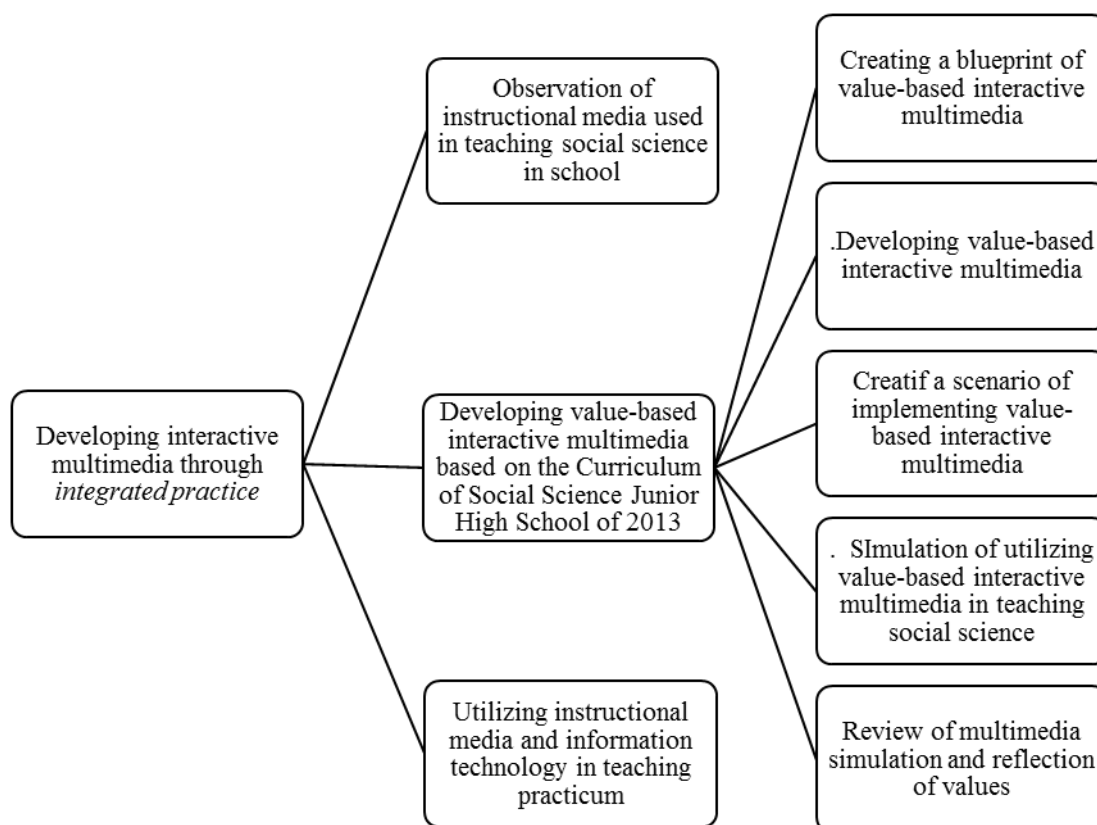


Figure 2: Developing Value-based Interactive Multimedia through Integrated Practice

Effect of Application of Value-Based Interactive Multimedia through Integrated Practice on Students' Character Development

The test analysis of $n - \text{gain}$ reveals that in each class, the experimental class and control class, students character increased, but there is a difference in the degree of increase between these two classes. In the control class, the increase is 0.30, which means that the increase is at $n\text{-gain } g < 0.7$, a category of medium. Meanwhile, the increase in the experimental class occurs at 1.04, equivalent of $n\text{-gain} > 0.7$, a high category. $N\text{-gain}$ test results can be seen in the table 1.

Table 1: Increase in Character Score in Pretest and Posttest of Control and Experiment Groups

<i>Data</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Variants</i>	<i>Gain</i>	<i>N Gain</i>
<i>Pretest</i> in control	56.65	5.641	31.823	1.32	0.30
<i>Posttest</i> in control	69.93	4.752	22.584		
<i>Pretest</i> in experiment	57.27	5.511	30.369	4.48	1.04
<i>Posttest</i> in experiment	106.28	8.693	75.576		

Based on the analysis of $n - \text{gain}$ test, it can be concluded that in both experimental and control classes increase occurs; however, increase in the experimental is greater than that in the control. Based on calculation of $n\text{-gain}$ significance, the significant value is smaller than $\alpha (0.05)$, indicating that there is a significant difference in the character development of the students in the experimental and control groups.

Value-based interactive multimedia through integrated practice in instructional media and ICT of social science education can nurture the character of students. This is apparent on the students' behavioral patterns in the process of developing the media. Descriptions of Students character that developed through Value-Based Interactive multimedia development can be seen on table 2.

Table 2: Characteristics of Students in Value-Based Interactive Multimedia Development

No	Character	Behavioral Patterns in Developing Interactive Multimedia
1	Creativity	Creativity in making instructional scenarios and produce value-based interactive multimedia products
2	Curiosity	Increased curiosity on technology, as demonstrated by willingness to learn to develop interactive multimedia
3	Appreciation	the ability to appreciate and review interactive multimedia work of their own and other students
4	Hard work	Optimal performance in planning/designing media/creating a scenario, developing multimedia, and simulating it in class, as well as utilizing it in school;
5	Self-reliance	Individual work management in accordance with sub-topics and simultaneously coordinating with the groups of the same topic
6	Honesty	Citing sources from the internet and others and using them as materials used in developing value-based interactive multimedia
7	Discipline	Accuracy in completing the task in accordance with the agreed upon timetable and goals

DISCUSSION

Interactive multimedia evinces characteristics that distinguish it from other types of instructional media, namely, it is interactive; has more than one converging media (audio and visual); provides convenience of feedback; give the freedom to independently determine the topic of learning and conduct the ease of systematic control in teaching social science (Sutopo, 2003; Munir, 2012). In addition, interactive multimedia offers the following advantages: 1) learning is more innovative and interactive; 2) teachers will always be required to be innovative in seeking a breakthrough in teaching; 3) it combines texts, pictures, audio, music, animated images or video in a single entity in order to achieve the learning objectives; 4) it boosts students' motivation in the learning process; 5) it visualizes the material perceived difficult to be explained merely through a lecture or a conventional props; and 6) it trains students to be more independent in gaining knowledge. Given these characteristics and advantages, the students are more motivated to attend lectures and understand the learning material.

Interactive multimedia applied in social science education classrooms is a value-based one. The values of life are integrated in interactive multimedia, so that the instructional media not only motivate the students to learn and understand the material, but also explore, clarify, internalize the values and apply them in everyday life. This is in accordance with the concept of micro character education in schools (Ministry of National Education, 2010) that values should be integrated in the learning activities. Komalasari (2012) and Komalasari et al. (2014) assert that character values must be integrated in learning across all of its components, including materials, methods, media, resources, and assessment. Thus, media as one component of learning should be based on values. Value-based interactive multimedia complement character education in class, namely teaching or guidance to the students to make them realize the truth, virtues, and beauty through the process of considering the proper value and consistent actions. Character education is aimed to help students to understand, realize and experience values and be able to apply them in their life (Mulyasa, 2005).

Value Integration in interactive multimedia can be done through a variety of character educational approaches as stated by Banks (1990) as follows: 1) Evocation, an approach that provides the students the opportunity and freedom to freely express their affective response to stimuli they receive; 2) Inculcation, an approach in which the students receive a stimulus directed toward a poised state; 3) Moral Reasoning, an approach in which intellectual taxonomic transactions occur in seeking a solution to a problem; 4) Value Clarification, an approach through targeted stimulus in which the students are invited to seek clarity of the message of moral values; 5) Value Analysis, an approach in which the students are stimulated to perform analysis of moral values; 6) Moral Awareness, an approach in which the students receive a stimulus and raise an awareness of certain values; 7) Commitment Approach, an approach in which the students are invited to agree on the existence of a mindset in the character educational process from the outset; and 8) Union Approach, an approach in which the students are directed to implement values in their real life.

Thus, value-based interactive multimedia can exhibit the knowledge, skills, and attitudes of values. Values can be presented in a variety of interactive multimedia, for example, through a motivational video or a video of character. Not only that, the lecturer should facilitate the students to clarify the value out of the video, and reflect on how it is applied in everyday life in a family environment, campus, community, and the country.

Interactive multimedia in instructional media and ICT learning of social science education is done through integrated practice (Xiaoman, 2006). This shows two forms of integrated practices, namely:

1. Integration of theory and practice in manufacturing instructional media in social science education; the students are equipped with an understanding of the relevant theory of instructional media and ICT as well as how to develop the practice of instructional media and ICT according to the curriculum of 2013.
2. The integration of classroom lectures with practice in schools; the students develop instructional media and ICT in social science education in classroom lectures based on the analysis of observation of instructional media used in schools, and the result of the development of instructional media and ICT will then be utilized in schools in teaching practicum activities.

This activity will be more beneficial to the students of social science education as future teachers in developing and utilizing instructional media and ICT in social science education. It is also in line with the notion of Edgar Dale (Heinich, et al., 2005) that hands-on experience is the most effective medium for the achievement of learning outcomes because it provides a concrete experience to the students.

Value-based interactive multimedia development through integrated practice can develop the character of the students. This further confirms that character education can be integrated in the lectures, either through direct learning in the classroom and outside the classroom, and learning is not directly in the form of nurturant effects of learning activities (Ministry of National Education, 2010; Komalasari, 2012). The substance of value is not solely captured and taught, but it is rather internalized, and standardized as an inherent part of the personal qualities of a person through the learning process. Therefore, the educational process is basically a civilizing process that produces a civilized man, including a cultured man (Hermann, 1972; Saripudin and Komalasari, 2016b)

CONCLUSION

Value-based interactive multimedia in social science learning is the integration of the values of life and social studies learning materials into interactive multimedia by involving students through an integrated practice in classrooms. The model was carried out through several steps: negotiation of subject matter and character, material presentation, group division based on the social science topics of junior high school, exploration of character values according to the topics, and integrated practice (initial observation to school, development of multimedia scenario, multimedia production, multimedia simulation in the classroom, and practice on the use of multimedia in school). There is a significant difference between the class using value-based interactive multimedia through integrated practice with that of a conventional classroom. Therefore, students at institutes of teacher education, as prospective teachers, should be equipped with the ability to craft value-based interactive multimedia through a combination of theory with practice, and a combination of practices in the classroom and in school.

ACKNOWLEDGEMENTS: The research is a grant from the Indonesia University of Education. The author would like to express sincere appreciation for all support provided.

REFERENCES

- Banks, J. A. (1990). *Teaching Strategies for the Social Studies: Inquiry Valuing and Decision Making*. (4th Ed.) New York: Longman.
- Borg, W. R., Gall, M.D., (1989). *Educational Research: An Introduction* (5th ed). New York: Longman.
- Daryanto. (2010). *Media Pembelajaran*. Bandung: PT. Sarana Tutorial Nurani Sejahtera.
- Fraenkel, J.R., Wallen, N.E. (2006). *How to Design and Evaluate in Research*. New York: The McGraw-Hill Companies, Inc.
- Green, T.D., Brown, A. (2002). *Multimedia Projects in the Classroom*. United States of America: Corwin Press, Inc.
- Heinich, R., Molenda, M., Russell, J. D., & Smaldino, S.E. (2005). *Instructional Media and Technology for Learning*, 7th edition. New Jersey: Prentice Hall, Inc.
- Hermann, (1972). "Value Theory (Axiology)". *The Journal of Value Inquiry* . VI:163-184.
- Hofstetter, F.T. (2001). *Multimedia Literacy*. Third Edition. McGraw-Hill. International Edition: New York.
- Komalasari, K. (2010). *Pembelajaran Kontekstual: Konsep dan Aplikasi*. Bandung: Refika Aditama.

- Komalasari, K. (2012). The Living Values-Based Contextual Learning to Develop the Students' Character. *Journal of Social Sciences*. 8 (2), 246-257. DOI: 10.3844/jssp/2012.246.251.
- Komalasari, K. Saripudin, D., Masyitoh, I.M. (2014). Living Values Education Model in Learning and Extracurricular Activities to Construct the Students' Character. *Journal of Education and Practice*. 5 (7), 166-174.
- Komalasari, K., Saripudin, D. (2015). Integration of Anti-Corruption Education in School's Activities. *American Journal of Applied Sciences*. 12 (6), 445-451. DOI: 10.3844/ajassp2015.445.451.
- Komalasari, K and Sapriya. (2016). *Living Values Education in Teaching Materials to Develop Students' Civic Disposition*, The New Educational Review. 44 (2), 107-124.
- Lickona. (1991). *Educating for Character (How Our Schools Can Teach Respect and Responsibility)*. New York: Bantam Books.
- Mayer, R.E.(2009). *Multimedia Learning*, Yogyakarta: Pustaka Pelajar,
- Ministry of National Education. (2010). *Desain Induk Pendidikan Karakter*, Jakarta: Kementerian Pendidikan Nasional.
- Mulyasa, E. (2005) . *Menjadi Guru Profesional Menciptakan Pembelajaran Kreatif dan Menyenangkan*. Bandung: Remaja Rosda Karya.
- Munadi, Y. (2008). *Media Pembelajaran*. Ciputat: Gaung Persada Press.
- Munir. (2012). *Multimedia: Konsep dan Aplikasi dalam Pendidikan*. Bandung: Alfabeta.
- Saripudin, D. and Komalasari, K., (2015). Living Values Education in School's Habituation Program and Its Effect on Student's Character Development. *The New Educational Review*. 39 (1), 51-62.
- Saripudin, D. and Komalasari, K., (2016a). The Development of Multiculturalism Values in Indonesian History Textbook. *American Journal of Applied Sciences*. 13 (6), 827-835. DOI: 10.3844/ajassp.2016.827.835.
- Saripudin, D. and Komalasari, K. (2016b). Culture-based Contextual Social Studies Learning for Development of Social and Cultural Values of Junior High School Students. *The Social Sciences*. 11 (23), 5726-5731. DOI: 10.3923/sscience.2016.5726.5731.
- Shadish, W.R., Cook, D.T., Campbell, T.D. (2002). *Experimental and Quasi-Experimental Design for Generalized Causal Inference*. Boston, New York.: Houghton Mifflin Company
- Sutopo, A.H. (2003). *Multimedia Interaktif dengan Flash*. Yogyakarta: Graha Ilmu.
- Tillman, D. (2004). *Living Values: Activities for Children Ages 8-14*. Jakarta: PT Gramedia Widiasarana Indonesia.
- Vaughan, T. (2004). *Multimedia: Making It Work*. Edisi keenam. Yogyakarta: Andi.
- Yunianto (2009). *Living Values: An Educational Program Educator Training Guide Pendidikan Nilai: Program Pendidikan LVEP Panduan Pelatihan bagi Pendidik* [online]. Available: http://heruyunianto.blogspot.com/2009/05/living-values-educational-program_26.html [Accessed on Februari 9, 2014]
- Xiaoman. Z. (2006). Moral Education and Values Education in Curriculum Reform in China. *Front. Educ.China*, 2: 191-200.

Vestiges of Digital Citizenship in Students of a Mexican University

Carlos Arturo TORRES-GASTELÚ

Veracruzana University - Mexico
ctorres@uv.mx

Joel ANGULO-ARMENTA

Technological Institute of Sonora – Mexico
joel.angulo@itson.edu.mx

Agustín LAGUNES-DOMÍNGUEZ

Veracruzana University - Mexico
aglagunes@uv.mx

Jose Luis SOTO-ORTÍZ

College of Veracruz – Mexico
jlso.uv@gmail.com

ABSTRACT

The purpose of this document is to identify the actions that students perform as digital citizens. This is a qualitative study carried out to students of three degrees: Administration, Tourism Administration and Administrative Computational Systems in the Faculty of Administration of the Veracruzana University in Mexico. For this, an interview guide was developed that allowed to understand the daily practices and habits of the students. The collection technique used was the discussion groups, the interviews were recorded, the transcripts were later made and the codification and interpretation of the data were carried out. Evidence indicates that the role of the University in the process of building digital citizenship is modest. Given the weaknesses detected by the low rate of actions that students perform as digital citizens, it is necessary to redouble their efforts in the complex process of building digital citizenship.

INTRODUCTION

Many universities around the world accept the fact that a change is necessary to make at this time. This fact is related with the relevant function of the university in order to fight against digital divide in the society and their responsibility to develop attitudes, skills and knowledge in students. One of these key competencies needed to be developed is Digital citizenship.

According to Mossberger, Tolbert and McNeal (2007) Digital citizenship is related with the ability to participate in society online and requires regular and effective Internet access and the skills to use the technology. These authors said that Digital citizenship can be measured by the political and economic activities that individuals engage in online. In order to get a Digital Citizenship there must be present so many aspects, for instance access to high-speed connections at home, hardware and software, technical skills, basic literacy, and information literacy, including critical thinking skills needed to evaluate and utilize information online (Mossberger, Tolbert and Stansbury 2003; Hargittai 2002; DiMaggio et al. 2004; Warschauer 2003; Van Dijk 2009).

However Ribble, Bailey and Ross (2004) emphasized that Digital citizenship can be defined as the norms of behavior with regard to technology use. As a way of understanding the complexity of digital citizenship and the issues of technology use, abuse, and misuse, these authors identified nine general areas of behavior that make up digital citizenship: (1) *Etiquette*: electronic standards of conduct or procedure; (2) *Communication*: electronic exchange of information; (3) *Education*: the process of teaching and learning about technology and the use of technology; (4) *Access*: full electronic participation in society; (5) *Commerce*: electronic buying and selling of goods; (6) *Responsibility*: electronic responsibility for actions and deeds; (7) *Rights*: those freedoms extended to everyone in a digital world; (8) *Safety*: physical well-being in a digital technology world; and (9) *Security* (self-protection): electronic precautions to guarantee safety.

So, we could say that there are so many different dimensions to take care in consideration during the teaching process of digital citizenship. This process should begin in basic education and continue until university level. In this sense, Rivero (2014, p. 6) explains: “Teaching digital citizenship leads to the discussion of issues such as cyberbullying, online privacy, sexting, digital footprints, online image, reputation management, acceptable use policies, and much more”.

One key point related with digital citizenship is related with information inequalities and possibly to prevent them. This is a very crucial task around the world, but specially in Latinamericans countries where there are so many matters to develop. There is a big risk of increasing the prevailing tendency in World Information Society of exclusive. So, the idea to be inclusive is related with the understanding of the role of ICT in relation to people’s ability to participate in society. In this sense, one big responsibility in the process of an integral education is in charge of the university. This entity should be able to develop attitudes, skills and knowledge to their students in order to prepare them to be inserted in the society as digital citizenship. This becomes a huge task and demands to be creative in the ways to perform it.

According to Wahl-Jorgensen, Bennett and Taylor (2017) the impact of new ICT on civil society, participatory democracy and citizenship is of immense contemporary concern. This impact is usually associated with the demand of universal access. but universal access/service alone does not suffice. So, in Latinamericans countries remains as a pending task to complete the universal access and the provision of technological issues such connectivity and equipments, and now emerges the need to develop an e-culture in the society providing information about the proper rights and responsibilities in the conditions and complexities of the Knowledge Society. In this terms, this becomes a new gap era: not just people online and offline, because there will be new classification of people. Those who are literate in digital citizenship participation and those who are illiterate in those matters.

METHODOLOGY

This is a qualitative study who uses an interview guide to students in the Faculty of Administration of Veracruzana University in Mexico. The bachelor degrees selected were Administration, Tourism Administration and Administrative Computational Systems. Seventeen students were chosen registered in the seventh semester during the period from August 2016 to January 2017. For this, 3 discussion groups were held. The first one with 7 students of the Administration bachelor degree, the second with 5 students of the bachelor degree of Tourist Administration and the third with 5 students of the bachelor degree in Administrative Computational Systems.

The interview guide included 14 specific questions that addressed aspects about the actions they perform as digital citizens, the forms of manifestation of their digital citizenship on the Internet, as well as the ways in which they make valid their citizenship with the authorities. The interviews were recorded, the transcripts were made, the content analyzed, the categories extracted and the interpretation of the findings generated. At the end of this process, we noticed the marked trends that existed and it was decided to convert the qualitative evidence to a database with quantitative answers and proceeded to perform the calculations of descriptive statistics. This paper presents the numerical results of the main findings in percentages. As well as some inferences obtained based on the analysis of content in the speeches of the students.

For the purposes of this study, it is important to recognize that there are several circulating versions of what the concept of digital citizenship means (Gutiérrez, 2003, Casablanco, Schwartzman, Burgh, 2014, Dussel, 2014), both in broad social discourse and in one review of scholarly publications. Thus, we find conceptualizations that are more linked to the political rights and obligations of the subjects in the context of the information society, others related to human rights, and finally some that circumscribe their influence to concepts related to digital literacy.

With regard to participation, we agree on what was found with Dussel (2014) who proposes a new look on this concept, invites to revise it understanding that there are old and new citizenships that make an analytical appearance as a result of digital technologies. So, the approach of this study to digital citizenship does not only deal with the artefactual dimension of technologies (Álvarez and Méndez, 1995), but also with the conception of technology as a cultural resource (Casablanco, 2008) and Internet as a territory for action (Schwartzman, Tarasow and Trech, 2014).

In this sense, the current society is immersed in a process of construction of the concept of digital citizenship that involves the redefinition and assimilation of new ways of doing things, of communicating with others, of consulting information and building knowledge through of these virtual interactions. Therefore, the creation of spaces in the network that facilitate social participation is encouraged as a mechanism to strengthen democracy.

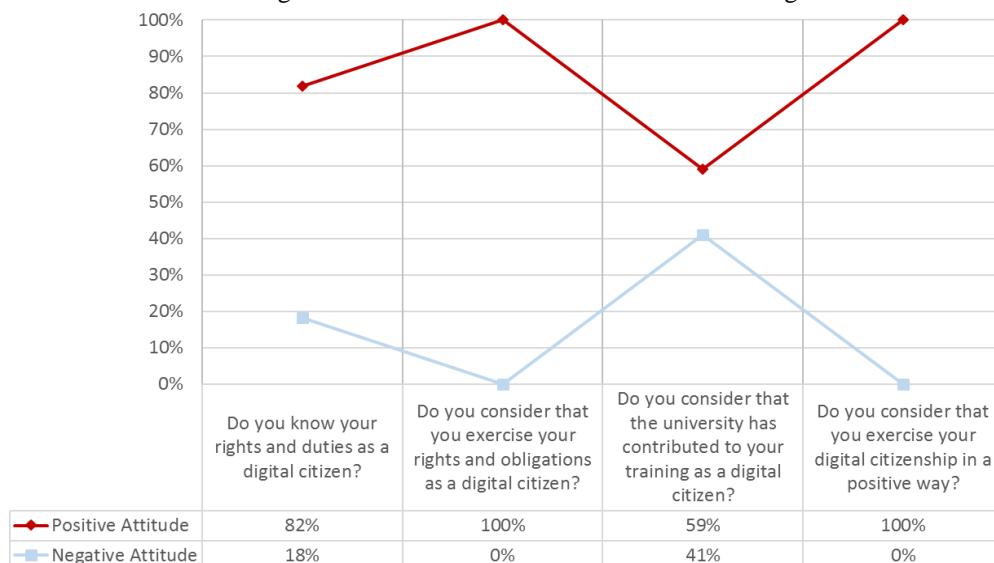
FINDINGS

The first category referring to the practices that students carry out as digital citizens addresses four questions (Figure 1). 82% of university students say they know their rights and obligations as digital citizens, while 18% say they do not know them. While all of them consider that they exercise their rights and obligations as digital citizens. In the same sense, all students consider that they exercise their digital citizenship in a positive way.

It should be noted that the participants identified themselves as digital citizens by simply surfing the Internet: "... I think that a digital citizen is that person who uses technology ... I think everyone at this time is a digital citizen because we live with the Technology, we use social networks and different media ... " (Joshua - Student of Tourism Administration).

However, this restrictive view that some of the students pointed to regarding access to technology as the differentiating element is simplistic and far from an integral concept of digital citizenship in terms of exercising with full awareness and fullness its role, specifically in terms of their participation online either as routine social practices or by ways of intervening in public affairs over the Internet.

Figure 1. Practices of the students that make as digital citizen



On the other hand, 59% of the participants consider that the university has contributed to their training as digital citizens, while 41% think that the university has not contributed to this training process. The training that the University has adopted has focused on incorporating ICT in the teaching-learning process: *"... the university is changing the way I see the Internet because more and more the internet is needed, Another way although we do not want to see it like this ... in fact, before entering university I almost did not upload tasks or things like this, almost everything written or printed paper and now almost everything is through the internet, I sent my tasks, I check my files and Other ... in fact I do not even look for books anymore or is almost everything searched on the internet, I look for books on the internet in fact ..."* (Joshua - Student of Tourism Administration).

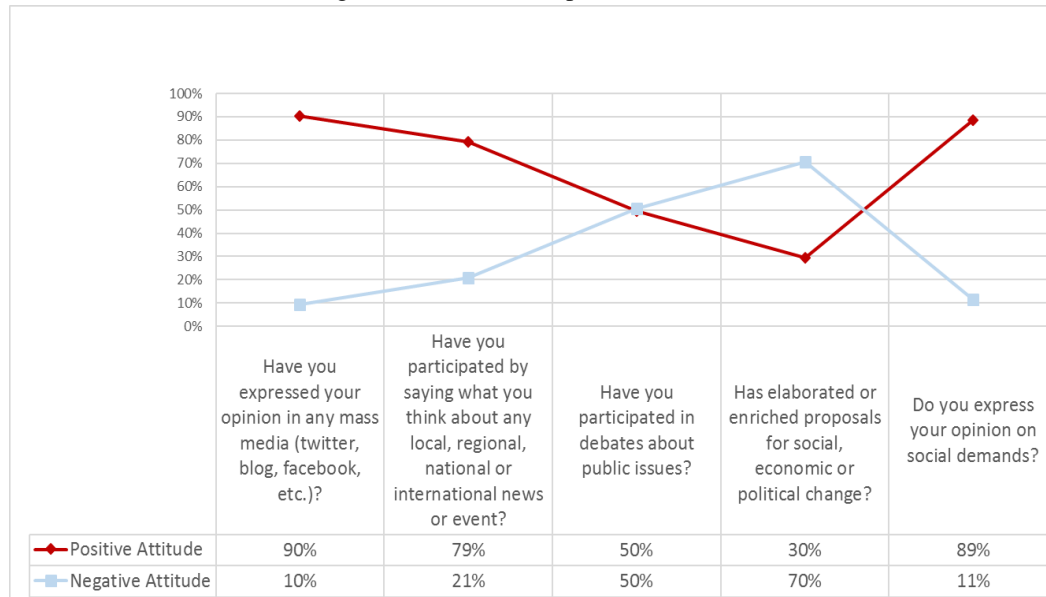
However, the role of the University in the formation of a digital ethic is considered as a partially covered task: *"...I think that in college, the only thing they have done is to remind me of the teachers what I already know...Because I feel that the school does not have to take care of that, rather the school simply ... and more at the university level is in charge of your professional training, it is rather to know that is right and that is wrong, there is a question of ethics...there are some teachers who among the talks in class emphasize that it is what is good, what is bad ..."* (Daniel – Student of Administration).

On the other hand, some informants consider that the University has helped in the process of training them as digital citizens since they have approached them to become acquainted with a range of technological tools and applications that allows them to understand that this should be done in the near future as citizens : *"... here in the university they have given us the tools to exercise more our digital citizenship, as the applications that we handle to make formalities, to register, to see our qualifications ..."* (Melissa – Student of Administrative Computational Systems).

In this sense, Lara (2009) points out that the University is in a critical moment to redefine its role in society so that its work maintains its social legitimacy as the mechanism for the integral formation of future citizens. To do this, it is required that the University incorporates the development of a digital culture as part of the learning experiences in students. Within the aspects of the digital culture that are advisable to incorporate in the formative process of the students are the diverse forms of participation, interaction, collaboration and behavior required as digital citizens. The challenge of the University is to train future digital citizens to be ready to join the knowledge society.

In the second category related to online participation as citizens is comprised of five questions (Figure 2). 90% of university students indicated that they have expressed their opinion in some mass media (twitter, blog, Facebook, etc.). While only 10% said they have not expressed their opinion in these media. Concerning the questioning of whether students have expressed their opinion on any local, regional, national or international news or event, 79% said yes, while 21% said no. However, in relation to whether the participants have expressed their opinion on social demands, a clear trend was not achieved since in both cases 50% was obtained. This result contrasts with the fact that only 30% of the participants indicated that they have developed or enriched proposals of social, economic or political change. Therefore 70% recognize that this is an aspect in which they do not participate.

Figure 2. Online Participation as Citizen



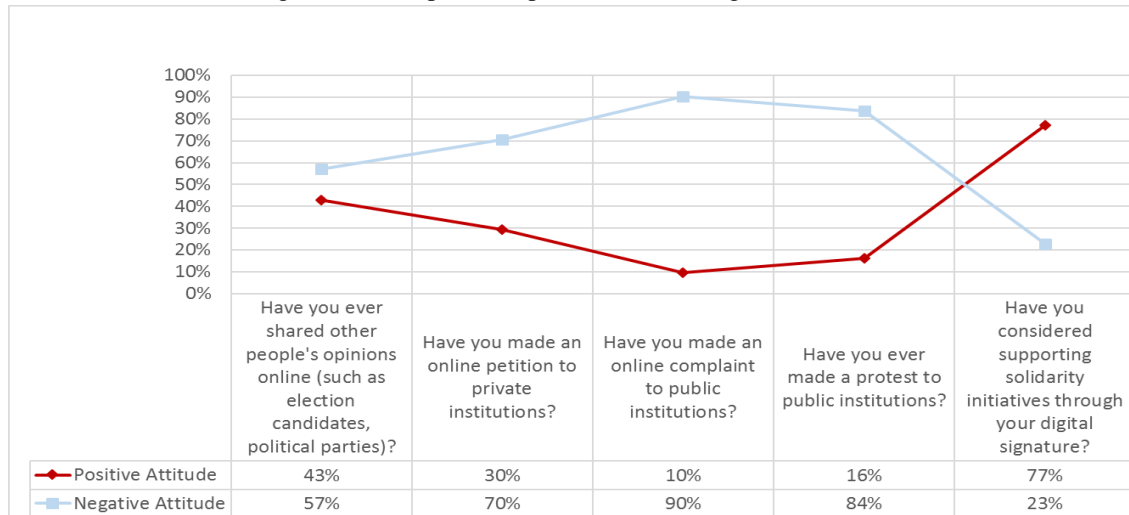
Regarding whether university students have expressed their opinion in some mass media, the evidence indicates that they come to publish their comments mainly on Facebook, and restrict it to their circle of friends: *"...Sometimes I have published on Facebook, respect to political issues, to the problems we have had for example with the new president in our country ... some time ago if I published things referring to that we are not well in Mexico ... referent to homosexuality because I am in favor of this movement..."* (Susana – Student of Tourism Administration).

At the same time, a collective conscience has developed in relation to the prudence and moderation in the publication of his comments in mass media, partly because of the fear of the subsequent implications: *"...I do not remember if I have participated giving my opinion in some mass media...maybe some news. Because I do have some fear that they will retaliate simply by my point of view, so I am careful not to do so. Although, if there is a way that I can participate that I really know is going to help someone, then I do, but I just do not give my public opinion..."* (Alexa – Student of Tourism Administration).

In some cases, students pointed out that rather than being content producers, they are considered as content consumers and their work is limited to sharing something that was already posted on the web: *"...when I see some news I generally try not to give my opinion, I prefer to share it...perhaps for security reasons and avoid reprisals, you never know what can happen or how other people can take your comment and something so insignificant could create a bigger problem..."* (Mayra - Student of Tourism Administration). Students become socializing mechanisms of what happens in their environment: *"...it depends on the relevance of the topic, if it is something that is very important and that society really needs to know and be informed, whether it should share it, but it is something trivial has no case..."* (Montserrat – Student of Tourism Administration).

In the third category on the participation of university students in public affairs over the Internet, five questions were asked (Figure 3). This dimension reflects a clear tendency towards the absence of participation in most of the items. First, 90% of students said they had not filed an online complaint with public institutions, contrasting with 10% who said they had. In this same sense, 84% of university students said they had not made a protest in public institutions, while 14% indicated that they had ever made a protest in at least one public institution. Regarding whether they have made an online petition to private institutions, 70% of university students said no, and only 30% indicated that they had done so. Regarding whether they have ever shared other people's opinions online (as election candidates, political parties), 57% of university students said no, contrasting with 43% who said that they had shared their views on this subject. The only question in which there was a greater positive trend was when 77% of participants indicated that they have considered supporting solidarity initiatives through their digital signature, while 23% said they had not considered it to date.

Figure 3. Participation in public issues through the Internet



In this category, the aspect in which the students showed a greater positive attitude is related to the support for solidarity initiatives through their digital signature: "... if I have shared my opinion, for example, when it comes to discussing some energy reform and other reforms. I even signed some change.org initiatives there, although I'm not sure if it serves anything, but I think it's a way of expressing my digital citizenship..." (Ali - Student of Administration).

Although the students are open to supporting different types of initiatives, they do not follow up on the cause they supported, nor do they noticed about the outcome of this initiative: "...If I have signed on several occasions, Is very interesting but I never finish knowing if they do what they set out..." (Nahomy - Student of Administrative Computational Systems).

Also, some of the students expressed their interest in supporting initiatives for the preservation of the environment or for the conservation of animal species: "...if I am interested when it comes to environmental problems or to save animals, I am not interested when it comes to People..." (Karla - Student of Tourism Administration).

The second aspect that presented a greater positive attitude of university students was if they had ever shared opinions online about political issues such as election candidates or political parties: "...I have commented on this issue but only with regard to proposals made by candidates ... not so much if you like the politician or not ... I think it's about taking the necessary data to make an electoral decision and not so much if you like it, but identify what that candidate is going to do if he wins" (Liliana – Student of Administration).

In Figure 4 shows the global results by dimension. The first dimension related with the action the university student perform as digital citizen shows a clear tendency of positive attitude (85.2%). That means that college students consider themselves as individuals formed in their role as digital citizens. Although it is clear that they have a limited conception on the ways to exercise their digital citizenship. Partly because they have not yet acquired other responsibilities. Remember that most college students still depend economically on their parents and have no work experience. On the other hand, in Mexico the right to vote for the election of governors is when they turn 18, the average age of the participants was 21 years, so at least they already had a democratic exercise experience of 3 years.

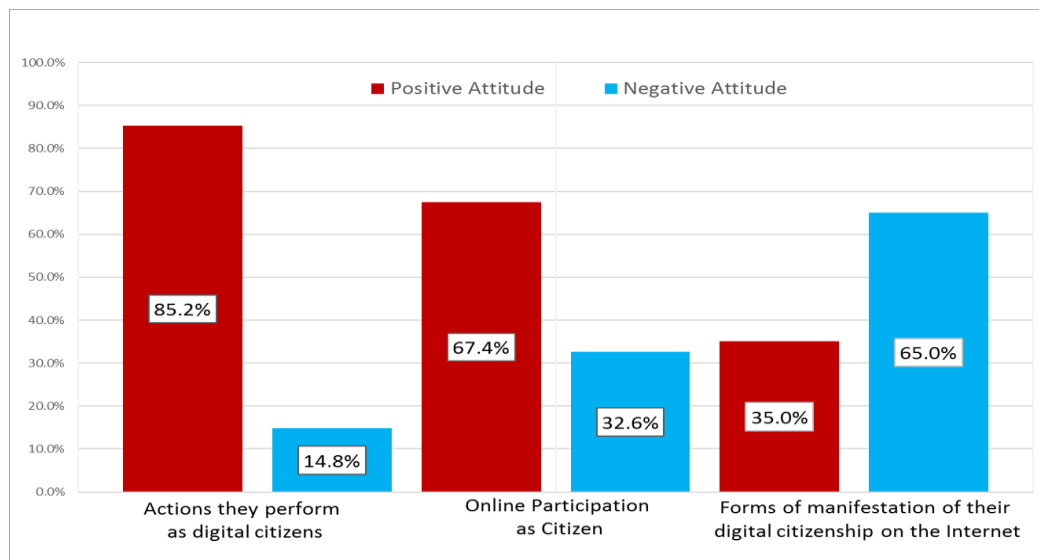
Because the University plays a central role in the lives of these young people as it is the main activity that most of them play, and taking into account the short vision that the students identify when associating digital citizenship with the simple fact Being on the Internet, it seems vital to reflect on the ways in which the university and the government are attending to the integral formation of those who in the near future will be the digital citizens.

The second dimension referring to online participation as citizen also shows a positive tendency (67.4%). The university students state that they have expressed their opinion in some mass media, as well as that they have expressed their opinion about some news or event. However, most of them show an active online participation that is limited to their acquaintances in social networks since when it comes to evidence their online activity on public debates or their contribution in the elaboration or improvement of proposals the university students have a low level of participation. The evidence suggests that it is necessary to strengthen the level of maturity as digital citizens in terms of being aware of their environment, their city and in general by the Society.

The third dimension attends the forms of manifestation of the students about their digital citizenship on the internet, in this case there is a tendency by a negative attitude. Evidence of this dimension reflects a greater weakness in the training process of university students in their performance as digital citizens. The most positive aspect in this area is that all students have made an online complaint to public institutions, although most of the complaints are of individual interest, showing a low concern for the collective interest.

Possible causes in the low rate of participation in public affairs through the Internet in university students may be associated with at least two factors that were detected in the evidence: apathy and insecurity. The apathy of university students towards their participation in public affairs is associated with a lack of credibility towards institutions due to corruption and impunity. While the insecurity is related to the fear that exists in the Mexican Society due to the increase of violence and delinquency.

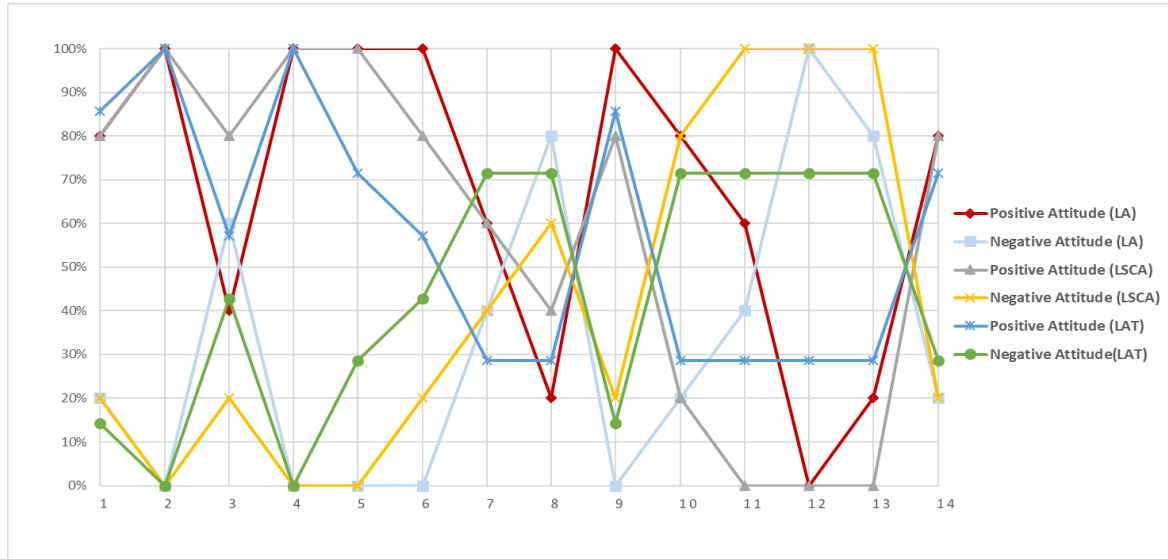
Figure 4. Global results by dimension



In Figure 5 appears the tendency of the university students organized by the three bachelors: Administration bachelor degree (LA), Tourist Administration bachelor degree (LAT) and Administrative Computational Systems bachelor degree (LSCA). In general, as you can see in Figure 5 the opinion of the students is very similar even if they are studying a different bachelor. However, it is recommendable to make an extensive Statistical study with a significant sample in order to verify these tendencies.

However, the qualitative fieldwork made it possible to understand a little more the positioning that students have regarding the construct of digital citizenship. It was also useful for the development of a quantitative instrument in order to be applied to a significant sample and to continue with the comparative analysis stage of the study.

Figure 5. Attitude tendency by bachelor



CONCLUSIONS

In general terms, there is a certain reserve in the participation as digital citizen, partly due to the uncertainty and insecurity that afflicts the Mexican society. It shows an interest in the great themes and daily events that afflict the country, but it does not participate in open sectors.

The manifestations of their opinions as digital citizens are scarce. They link their role almost exclusively in terms of their social networks and in a relaxed, uncritical environment and with no desire to make any contribution to society. Their online participation is visualized as an extension of their social life in their immediate circles, but it is not possible to glimpse the potential of their voice in the virtual environment.

The level of participation is expressed as a spectator, they like to know what happens in society, but they maintain discretion regarding their opinions and the means they occupy. The interviewees' actions on demands or petitions adopt positions of personal interest, and not so much to attend to community issues, being evident an individualistic personality in their digital act.

On the other hand, online participation in political interests is limited, partly to avoid conflicts or online discussions. There is evidence of a high sense of discretion in public affairs, partly because of the fear of reprisals or to maintain a harmonious situation in virtual interactivity.

They identify that they have had an evolution in the last 3 or 4 years that has allowed them to be more mature in the forms of social interaction in virtuality. Specifically what they say, how they say it and who they tell it to. A selective debug scheme has been generated on when and how to manifest on the Internet.

Finally, university students emphasize the value of the University and recognize the development of skills and knowledge they have obtained, but they are limited to identifying the acquisition of technological competencies in relation to the use of a range of technological tools. For what remains a task pending the strengthening of a ethics behaviour to become in responsible digital citizenship.

Therefore, the role that the University has played requires to be analyzed and to take measures so that, through its formative process, it fights against social inequality and cultural difference by seeking the development of digital competences. In particular, it is necessary to generate strategies to strengthen literacy, not only in terms of the use of ICT, but also in the indoctrination of the ethics to become in digital citizens.

REFERENCES

- Álvarez, A. & Méndez, R. (1995). *Cultura Tecnológica y Educación*. En Sancho, J & Millán, L. (comp.) *Hoy ya es mañana. Tecnologías y Educación: un diálogo necesario*. Sevilla: Publicaciones.
- Casablancas, S. (2008). *Desde adentro: Los caminos de la formación docente en tiempos complejos y digitales. Las TIC como necesidad emergente y significativa en las clases universitarias de la sociedad actual*. Tesis de Doctorado. Universitat de Barcelona. Recuperado de: <http://www.tesisenred.net/handle/10803/13607>
- Casablancas, S., Schwartzman, G., & Burghi, S (2014, noviembre). *Cambiando paradigmas sobre ciudadanía digital en el Educato 2014*. Ponencia presentada en el Congreso Iberoamericano de Tecnología, Innovación y Educación OEI. Buenos Aires.
- DiMaggio, P., Hargittai, E., Celeste, C. & Shafer, S. (2004). Digital Inequality: From Unequal Access to Differentiated Use. In *Social Inequality*, ed. Kathryn M. Neckerman, 355–400. New York, NY: Russell Sage Foundation.
- Dussel, I. (2014) Viejas y nuevas ciudadanías: límites y desafíos de la participación. Educato 2014. Recuperado de: <http://www.educato.org.ar/crpnicas/viejas-y-nuevas-ciudadanias-limites-y-desafios-de-la-participacion>
- Gutiérrez, A. (2003). *Alfabetización digital. Algo más que ratones y teclas*. Barcelona: Gedisa.
- Hargittai, E. (2002). Second-Level Digital Divide: Differences in People's Online Skills. *First Monday* 7 (4): 1–20.
- Lara, T. (2009). El papel de la Universidad en la construcción de su identidad digital. *RUSC. Revista de Universidad y Sociedad del Conocimiento*. 6(1), 15-21. Recuperado de: <http://rusc.uoc.edu>
- Mossberger, K., Tolbert, C. J., & McNeal, R. S. (2007). *Digital citizenship: The Internet, society, and participation*. Cambridge, MA: MIT Press.
- Mossberger, K., Tolbert, C.J., & Stansbury, M. (2003). *Virtual Inequality: Beyond the Digital Divide*. Washington, D.C.: Georgetown University Press.
- Ribble, M.S., Bailey, G. & Ross, T. (2004). Digital Citizenship. Addressing Appropriate Technology Behaviour. *Learning & Leading with Technology* 32(1). 7-12. Retrieved from: <https://eric.ed.gov/?id=EJ695788>
- Rivero, V. (2014), "Digital world brave", *Internet@Schools*, Vol. 21 No. 1, pp. 6-8.
- Schwartzman, G.; Tarasow, F. y Trech, M. (2014): "Dispositivos tecnopedagógicos en línea: medios interactivos para aprender". En: Aprendizaje abierto y aprendizaje flexible: más allá de formatos y espacios tradicionales. ANEP Ceibal, Montevideo. Recuperado de: http://www.anep.edu.uy/anep/phocadownload/Publicaciones/Plan_Ceibal/aprendizaje_abierto_anep_ceibal_2013.pdf
- Van Dijk, J. A. (2009). One Europe, digitally divided. In A. Chadwick and P. N. Howard, eds. *Routledge Handbook of Internet Politics*, 288–305. London, UK: Taylor & Francis.
- Wahl-Jorgensen, K., Bennett, L. & Taylor, G. (2017). The normalization of surveillance and the invisibility of digital citizenship: Media debates after the Snowden revelations. *International Journal of Communication* 11, pp. 740-762. Retrieved from: <http://orca.cf.ac.uk/97854/>
- Warschauer, M. (2003). *Technology and social inclusion: Rethinking the digital divide*. Cambridge, MA: MIT Press.

Web-Conferencing: Interactive, Engaging, and Collaborative Online Learning

Linda ALLEN

*School of Education
Instructional Leadership Programs
Jacksonville State University
lcallen@jsu.edu*

William YOUNG

Jacksonville State University

Kim WARFIELD

Jacksonville State University

ABSTRACT

The inclusion of a web-conferencing room within an online course offers many new and exciting ways to support student learning. This virtual environment provides participants with face-to-face meetings where they can talk, question, and discuss a given topic in real time using both asynchronous and synchronous formats. With continuous improvements, a web-conferencing room is now more user-friendly and often includes a wide-range of embedded tools to heighten interaction during a live session. Teachers, who increase their knowledge and skill-set by exploring and utilizing a web-conferencing application, may find that it offers new ways to expand interaction, extend periods of student engagement, and enhance collaboration within an online course.

Keywords: collaboration, engagement, interactivity, online learning, web-conferencing

INTRODUCTION

As teachers consider ways to extend learning opportunities within their online courses, a variety of digital tools offer a platform for the development of creative instructional lessons and activities that have the potential to engage students and increase learning. Tools such as discussion boards, blogs, journals, and wikis have the capacity to open lines of communication between members in an asynchronous format. Many teachers are using these tools to encourage written dialogue between members. The addition of a web-conferencing room, within the online course, offers a stage for real-time sessions that include both written and verbal communication between members. The web-conferencing room steps up opportunities for engagement by also providing a live video feed that enables members to see and hear each other during face-to-face sessions in the virtual room. With a wide-range of additional digital tools embedded in the web-conferencing room, a live session can deliver a new facet in the way students can interact online. Teachers can design and conduct live sessions with students for orientations, mini lectures, tutorials, and demonstrations. During student-lead sessions, they can chat, discuss a topic, present, record sessions, and in addition to or as well as share content.

Teachers and students can interact in a web-conferencing room for presentations or meet with members for brainstorming and problem solving sessions. It is the perfect place to begin a course by providing an orientation session. This virtual environment offers real time meetings where members can talk, question, or discuss a given topic. Most web-conferencing rooms can also deliver a virtual learning space where members can interact by using a white board, participate in polls, share an application, or work together on content. Live sessions can even be recorded for students that might not be present.

With the wide-range of digital writing tools, many online teachers have not included the face-to-face sessions that can be provided through a web-conferencing room. With continuous improvements, most web-conferencing software are more user-friendly and often include a wide-range of embedded tools to support interaction during a live session. Teachers, who are willing to increase their knowledge and skill-set by exploring and utilizing a web-conferencing application, might just find that it offers new ways to enhance student learning. With numerous possibilities for the development and facilitation of learning activities and projects in an online course, teachers have a unique opportunity to include enhanced applications for student learning and engagement through web-conferencing sessions.

The Web-Conferencing Classroom

It is essential that a web-conferencing session be driven by the same goals, objectives, and learning outcomes as a traditional learning environment. Vai and Sosulski (2011) provided a best-practices model for designing online courses that also applies to live sessions. They proposed a practical approach informed by theory that includes a design that supports students from the beginning of the course. A quick-start guide that summarizes the tools should be included in the course assignment. This will provide students with the information they need to successfully join a session and begin using the tools to interact. A short how-to video could also be included in the course assignment as a guide for this virtual environment. Within the initial web-conferencing session, the teacher should plan a time of discovery for the students. Simple tasks can be embedded throughout the session to help students begin to use the tools for a variety of applications.

Research findings continue to emphasize the use of an appropriate pedagogical approach for course design and lesson development (De Freitas & Neumann, 2009; Murphy, Rodriguez-Manzanares, & Barbour, 2010). Thormann and Zimmerman (2012) and Via and Sosulski (2011) maintained that course design must focus on pedagogy, organization, and consider the visual aspects of the learning environment. This is true for online course development and lesson development for a web-conferencing session. These researchers also recommended that activities be designed to support student interest, interaction, engagement, and include social opportunities for the learning community (Thormann & Zimmerman, 2012 and Via & Sosulski, 2011).

Thormann and Zimmerman (2012) emphasized the importance of scaffolded assignments to heighten student learning. Lehman and Conceição (2010) proposed that online courses and lessons provide a blended approach that includes both asynchronous and synchronous activities throughout. Within the web-conferencing room, a skilled teacher can adopt both a scaffolded and blended approach to teaching. Many web-conferencing sessions include breakout rooms that deliver just the location where teachers can scaffolded small group learning activities. Breakout rooms usually allow the teacher freedom to move in and out to monitor each group's progress and support learning through careful questioning and redirection. By utilizing both a blended and scaffolded approach, lessons can be individualized and provide both written and verbal discussions constructed to extend the learning experience and encourage collaboration within the community of learners.

As teachers focus their efforts on the course content, a great deal of thought must be given to ensuring that students have a "high degree of interactivity and participation" within the course and online sessions (Conrad & Donaldson, 2011, p. 5). The actions and contributions generated by the learners should increase not only their individual understanding but also influence the growth of the online community (Conrad & Donaldson, 2011). In an online course, teachers can create assignments and activities that allow learners to become knowledge-generators who "assume responsibility for constructing and managing their own learning experience" (Conrad & Donaldson, 2011, p. 5). A web-conferencing environment offers a place for groups to meet, brain-storm ideas, and then find solutions for a case study or other scenario. Even though the members are located all over the state or even the world, they can meet in a web-conferencing room for face-to-face discussions and later come back to record and present their findings to the class. The opportunities for learning are only limited by the ingenuity and skill of the instructor. The careful planning that is spent during the development of assignments and activities for the course and web-conferencing sessions, along with the time spent by the teacher developing student relationships are essential components that boost student growth, engagement, and collaboration within the learning community.

After the development of a student-centered, interactive live session, the teacher must make a shift from a teacher-led approach to a role of facilitator. Within a web-conferencing session, the facilitator guides the learners through a variety of activities that are enhanced by the digital tools embedded in the room. The facilitator's confidence and skill in the web-conferencing room is necessary to effectively support interaction and engage students in the learning process.

Role of the Facilitator

A key role of the facilitator is to “moderate the discussions, thus focusing and deepening the work of the group and enhancing outcomes or products of the communal effort” (Collison, Elbaum, Haavind, & Tinker, 2000, p. 207). As a facilitator, the teacher must learn new strategies and skills that are appropriate for a web-conferencing environment. If web-conferencing is new to the instructor, some formal training may be needed to really see the full potential for learning in this environment. Reaching out to colleagues who are experienced users of web-conferencing tools can also provide additional insights. Consider inviting a group of teachers with various web-conferencing skills to meet in a web-conferencing room for a time of discovery and learning. This will allow everyone an opportunity to hone their skills and gain new knowledge and understandings. The new facilitator must take his or her own time to experiment and practice using each tool. It is also a good idea to be a guest in a colleague's session. This opportunity can provide a chance to experience the room from a different perspective which is helpful in fine tuning activities and using new strategies in upcoming sessions.

There are always unexpected situations and issues during a session.

In the context of constant technological change, a facilitator needs to develop

- confidence with the basic features and functions of the software
- resilience and adaptability to deal with the new versions and features
- a willingness to learn and relearn when new features become available
- creativity and flexibility to deal with or work around technical issues which arise
- an ability to establish appropriate support systems, mentors and other expert friends (Cornelius, Gordon, & Schyma, 2014, pp. 19-20).

Once the teacher feels comfortable with the technology and has developed several interactive activities for a session, it is time to expand his or her ability to question effectively. During a live session, the facilitator must listen carefully to discussions and pose questions that allow students to think deeply and reflect on their own understandings. The role of the facilitator in this situation is to provide an environment where the learner can clarify his or her thoughts. It is often easier to give advice or make a statement but the skilled facilitator understands the importance of allowing a student to refine his or her thoughts because it will have a longer-lasting impact on student development (Cornelius et al., 2014). Senge (1990) recommended the use of dialogue openers like: “Do you see gaps in my reasoning?” or “How did you arrive at your view?” Carefully worded questions can spur inquiry and reflection. It is important that the facilitator be the kind of teacher who “shares leadership with students and supports their work from the sidelines, more like a coach” (Collison et al., 2000, p. 208).

The Look and Feel of the Web-conferencing Room

First impressions cannot be under-estimated. Even though a teacher may not be able to address every visual aspect of a web-conferencing session, it is important that the session be both visually appealing and engaging to the learner. The desire of the instructor must be to provide a supportive and caring environment where the learner is challenged and engaged (Via & Sosulski, 2011). Given this understanding, both the look and feel of the live session must be interwoven. The physical appearance and the warmth brought to the session by the instructor are equally important. The inclusion of videos or podcasts can be very beneficial in supporting the content of an online course (Via & Sosulski, 2012).

However, within a web-conferencing session, video clips should be used sparingly and only a few minutes in length. Live sessions should not include lengthy video clips that are better embedded in the course for viewing later. A good rule of thumb might be: Avoid including anything in a live session that can be videoed and provided within a course learning unit. A live session should be designed to increase discussion, support social interaction, and give the members a sense of belonging in the group. How a session is designed will determine if it enhances student engagement, collaboration, and learning.

Unlike a course project that requires students to research and plan, a live session should include opportunities for students to share their findings, present ideas, and reveal implications in a variety of ways. The session should include many chances for students to discuss their work and respond to each other. Within a live session, the provision of opportunities for sharing, interacting, and collaborating can keep members focused and on-task.

Via and Sosulski (2011) recommended a variation of content-related experiences that address a “variety of modes” (p. 70). By carefully selecting and mixing quotes, graphics, tables, song clips, and short video clips that are related to the session topic, the instructor can ensure a media-rich environment that continues to draw the learners back into the session. By providing media that addresses many modalities, the teacher can add dimension to a session that will expand student learning. Mayer (2001) emphasized the importance of using words and images to support a topic. A web-conferencing room can provide areas for adding content through cartoons, PowerPoints, graphics, diagrams, tables, and charts. These can be opened in a white board and quickly shared and discussed with the students. Teachers are encouraged to seek-out and select content-related resources that can capture students’ interest and imaginations. Careful selection of activities and resources can provide a powerful and engaging live learning session that motivates and liberates student inquiry.

Learner Support

Within the online environment, multiple levels of support are needed. Even though many students come to the online course with a working knowledge of some of the applications used in a learning management system (LMS), others still struggle and are fearful of the software and digital tools that are needed to support the virtual learning environment. The instructor can ease many of the students’ concerns by providing different levels of support during the development of the course and through an initial web-conferencing orientation. A course syllabus, embedded course supports, and a web-conferencing orientation session can facilitate an easy transition for most students.

Students come to an online course with different expectations and experiences. It is essential that an orientation session provide the support needed to help each student become successful. The orientation is the beginning of the learning experience and it sets the tone of the course for the learner. Lehman and Conceição (2010) suggested “Online course orientation activities not only set the tone for the entire course but also create an opportunity for learners to get ready for a safe and comfortable environment” (p. 40). This initial introduction to the course can put the learner at ease and offer a platform where students can begin to build relationships. “A well-designed pre-course orientation can help learners feel they are part of the learning community” from the onset of the course. (Lehman & Conceição, 2010, p. 41).

A carefully developed and creative orientation session can bring much to the students in an online course. The session has the potential to provide the learners with information concerning the location and application of video tutorials and quick-start guides for many of the digital tools that will be needed to complete assignments throughout the course. The teacher can also introduce students to the online learning environment with a walk-through of the course. This can easily be accomplished while the teacher is in the web-conferencing room. Before the session begins, the teacher should open the course a second time using a different browser and leave it open in the background. This will allow the instructor to utilize a screen share tool provided in most web-conferencing rooms. When the teacher clicks on the screen share tool inside of the web-conferencing room, he or she can then locate and access the course that was opened in the background. Within a few seconds, the instructor can take the students on a walk-through of the course to discuss assignments, supports, and expectations. The walk-through also gives students an opportunity to ask questions as an assignment is discussed which promotes clarity early in the term.

A web-conferencing orientation can also provide an opportunity for an initial ice-breaker activity where learners have an opportunity to discover a little about their new classmates and instructor. This can put students at ease and make them more comfortable in the online course (Lehman & Conceição, 2010). A web-conferencing orientation, content session, or an individual conference can be used to support students in a variety of ways. As the teacher plans, consideration should be given to the impact that web-conferencing can have on supporting student learning and engagement.

Learner Engagement

Lehman and Conceição (2010) stressed the importance of technology being transparent and easy for students. “This means it should not be the course focus or a learning distraction; rather, it should be user-friendly” (p. 29). Thormann and Zimmerman (2012) pointed out the importance of defining an approach to learning and in so doing, integrate available technologies to support student engagement and learning. Within an online course, a web-conferencing session offers additional ways to meet this need. Thormann and Zimmerman (2012) emphasized that “Facilitating the exchange of ideas and concepts by building community is accomplished by creating a personal connection, fostering peer relationships, interacting with each student, and experimenting with new technologies” (p. 110). Within each web-conferencing session, the teacher must work to build and extend personal connections with the members. It is essential that the teacher provides a personal welcome to each student as he or she enters the session. An initial well-planned interactive group activity should also be developed so that students are actively involved with others in the group. Steed (2011) suggested that if learners were not engaged within 20 seconds after logging into a live session, they would begin to multi-task (reading emails, social networks, etc.). The digital tools embedded in the web-conferencing room help the teacher provide an orientation and other sessions throughout the course that are welcoming, engaging, and interactive as students share and grow together.

In a virtual environment, it is often difficult to gauge the level of student engagement during long periods of discourse. It is important for the teacher to limit the time that he or she shares content or information to the group. Short periods of three-five minutes can be planned throughout the session. The lesson plan must include several opportunities for students to refocus by using a quick question or task. By designing and infusing a variety of activities into the web-conferencing session, the instructor has a much greater provability of engaging students and keeping them on task.

The teacher’s skill in designing an interactive environment that includes web-conferencing sessions can have a tremendous impact on student engagement ($d=0.62$) (Marzano, 2000). Research has also shown that a positive teacher-student relationship can greatly influence student outcomes related to achievement and attitude ($d=0.72$) (Cornelius-White, 2007). Even though members of an online course are not sitting in a physical classroom for meetings, the web-conferencing room offers a forum for live discussion, interaction, and relationship building within the community of learners. This level of support is not currently utilized by the majority of online instructors.

Brand et al. (2006) determined that high-quality written and verbal interaction with the teacher is key to student engagement. By providing multiple opportunities for students to direct their learning through increased interaction and collaboration, the instructor strengthens the quality and value of the course (Conrad & Donaldson, 2011; Kearsley, 2000). Subsequently, a web-conferencing room offers several embedded digital tools such as breakout rooms, chat, polling, and screen share which were designed to encourage communication. By capitalizing on the available digital communication tools, different software applications can be used to provide written and verbal validation of student engagement during a web-conferencing session. Teacher accessibility and approachability go hand-and-hand with a student’s need to be validated. Through positive teacher-student interaction, student engagement and overall academic growth are increased (Brand, Galsson, & Green, 2006). By including web-conferencing sessions in a course, the teacher can extend access and opportunities for engaged learning that nurtures a student’s need to feel welcome and valued.

Lehman and Conceição (2010) verified the importance of “learner presence” (p. 4) within the online course.

Through intentional course design and planning, the teacher can provide an online course that feels comfortable and safe for students. Web-conferencing sessions allow students to collaborate and engage peers in face-to-face discussions. With numerous opportunities to communicate with members in stimulating, expressive, and caring ways, the learner becomes comfortable enough to share thoughts and ideas. Kumar's (1991) meta-analysis revealed strong relationships between effective time (active learning) and student achievement ($d=1.09$). Research has also shown strong correlations between student engagement and high levels of concentration (Datta & Narayanan, 1989). Activities like discussions, debates, case studies, and presentations encourage engagement and require students to reflect and critically think to resolve problems and find solutions. These types of activities can easily be woven into the course and implemented in a web-conferencing forum where students share results and findings. As a session feels more welcoming and provides opportunities for interaction and engagement, students become comfortable in the environment (Lehman & Conceição, 2010). The goal must be to create activities that engage, challenge, and connect learners (Conrad & Donaldson, 2011).

Learner Collaboration

With the wide range of communication tools embedded in most learning management systems and available in other platforms like Google Classroom, teachers have the digital tools to design online learning environments that support interaction and encourage collaboration. In their research on social presence, Tu and McIsaac (2002) found that online communication, social context, and interactivity are all contributing factors for students as they work and share together. They emphasized the importance of online interaction being stimulating, expressive, and carry sincere emotions. West and West's (2009) research indicated that students wanted learning experiences with social connections and participation. The addition of a web-conferencing room within the online course can provide many more opportunities for classmates to meet, work, and learn together.

The importance of providing activities that include opportunities for collaboration cannot be underestimated. Collaborative activities have a stronger impact on student performance than individual or competitive activities ($d=0.55$) (Roseth, Johnson, & Johnson, 2008). Recognizing the importance of providing opportunities for students to work together to resolve problems and share findings should encourage instructors to include a variety of collaborative activities throughout their online courses.

Hamm and Fairclough (2007) stressed the important role of friendships in the learning process. Supporting interaction and connection-building within the course is a powerful strategy for student academic growth. Friendships support the student's sense of well-being, belonging, and worth. Because these qualities play an important role in student engagement and performance, the teacher's contributions become very important (Hamm & Fairclough, 2005). The instructor's ability to support relationship building and develop activities including web-conferencing sessions can greatly increase the probability for interaction and collaboration within the membership.

Communication strategies must be given consideration. It is important to look at how and when students will communicate with the instructor and peers within the online course. The teacher must utilize email, text, chat, discussion boards, and web-conferencing tools as supporting vehicles for engagement and collaboration within the online course. The time and consideration given by the teacher as he or she develops collaborative activities will make a difference in the successful interaction of all members of the course.

Because online communication takes more planning for the members, time considerations must be given to activities that include several online meetings. With the additional time comes increased opportunities where "depth of thought is likely to be greater" (Conrad & Donaldson, 2011, p. 21). Asynchronous and synchronous communication between members provides a unique opportunity for critical thought about a topic, statement, or question. Again, the design of the activity can support or take away opportunities for members to learn together.

Session Development

Course Orientation Session

The importance of preparation, practice, and support are essential to a course orientation session using the web-conferencing room. The instructor must be able to move around in the room using the embedded tools with ease. This will provide the instructor with a forum to share information that is essential to course success. The initial activities for this session should begin with an introduction (ice-breaker) and then focus on helping students become familiar with the software and tools that will be used in this session and throughout the course. Remember, you can also record the session and it can be revisited by students when needed.

As you plan this session, consider providing questions for your students every five minutes or so to help them refocus. This can be accomplished by developing a set of questions that relate to the course content and use different tools for responses. The polling, chat, raised hand, or white board tools can be utilized to let students respond in different ways. This also allows them to use the tools and begin understanding how they can support learning. Later, as students present using the web-conferencing room, they will have gained some skill and confidence with the tools that are available to them.

Something else to consider might be to take the students through a course walk-through using the Share tool. As the teacher moves through the course learning units, major assignments can be reviewed and student questions addressed. A simple walk-through can provide clarity but it also eliminates student questions about the assignment early in the term. This is also a good time to introduce a few of the tools provided in the course. A quick review of creating a wiki page, developing a journal, or working in a blog can also be accomplished. Do not forget to go in and out of the walk-through to ask a question and get feedback from the students using the selection of tools provided in the room. This will help confirm that everyone is on task and engaged in the session.

Ice Breakers for the Web-conferencing Sessions

Setting up an appropriate learning climate is crucial to establishing a successful learning experience (Knowles, 1980). This is true for a traditional classroom and for an online course. Knowles' work focused on the importance of feeling accepted, respected, and supported within a learning environment. The development of a web-conferencing session must also be mindful of student needs. As the teacher designs a session, activities must ensure open lines of communication and provide opportunities for students to share and get to know each other. Conrad and Donaldson (2011) recommended the use of ice breakers to set the tone and support the development of the learning community. They suggested that, "An icebreaker should humanize the technology-mediated learning experience so that trust can begin to be built among the learners" (Conrad & Donaldson, 2011, p. 52). An ice breaker for an orientation or other web-conferencing session must be brief while providing some information about everyone in the course. The facilitator may consider using two or more in an orientation session to provide multiple opportunities for the students to make connections and begin building relationships with the other members of the learning community.

- Using the white board, ask all members to type or write their full name, county, state, or country and current position.
- Share three things you would like your peers to know about you.
- Tell something about yourself that many people do not know.
- Name your top two priorities (personal or professional). Tell us why.
- Include a slide with a map for the session that includes the location of everyone in the class. Using the white board, have the students mark where they live on the map and then share something they love about their home town.

Web-conferencing Activities

- Develop a list of questions that can be used throughout the session to help students learn more about each other by using the white board, chat, raised hand, and sometimes the polling tool. Skylar (2009) recommended using questions every three or four minutes during a web-conferencing session to support student engagement and interaction. These can be built into a PowerPoint that is used during the session.
- Develop additional questions for session content to be used with the polling tool during sessions where content is shared.

- Develop a list of questions that can be used to help students think critically using the chat tool. Example: What do you think about.... Type your answer into the text box in chat.
- After researching a topic, use a live session to have students work together in small groups using breakout rooms to discuss findings and record new learnings. The facilitator should move in and out of the rooms to check on discussions and provide questions that allow students to clarify their understanding.
- Video clips should be very short and have a real connection to the session learning. Always end a video clip with two or three thoughtful questions about the content using a polling tool. Take a minute and ask what the poll data is indicating.
- Develop a graphic organizer to collate responses. Allow student to respond in different boxes.
- Develop several different kinds of graphic organizers, SmartArt, and templates that can be added to the white board and used for monitoring responses. Use SmartArt in PowerPoints to add color and design that is inviting.

CONCLUSION

In the development of an online course, web-conferencing adds more opportunities to engage, interact, and collaborate within the online course. A successful web-conferencing session begins with a learner-centered approach that is focused on meeting learner needs within the context of the learning experience. The teacher takes on the role of a facilitator who guides and encourages students throughout the learning process. Salmon's (2011) work emphasized the importance of the facilitator being relaxed and well-acquainted with the digital tools. A variety of digital tools are available in the web-conferencing room to support and engage students in many ways. "This engagement does depend on how you are using the technology. It has to be with really purposeful activities that are dynamic and engaging for learners and enable the learner to have a voice within the session as well" (Cornelius et al., 2014, p. 9). The teacher must embrace student engagement as a priority that is revealed in his or her lesson plan and activity development for the session.

Collaboration is an essential component of an effective course and web-conferencing session. The web-conferencing room must provide learners with opportunities for interaction and collaboration. Facilitators must be "vigilant and proactive regarding student interaction and communication" (McBrien & Jones, 2009, p. 13). Time spent developing and fine-tuning activities that support collaboration within the web-conferencing session will reap the rewards of engaged students.

REFERENCES

- Brand, B. R., Glasson, G. E., & Green, A. M. (2006). Sociocultural factors influencing students' learning in science and mathematics: An analysis of the perspectives of African American students. *School Science and Mathematics*, 106(5), 228-236.
- Conrad, R. & Donaldson, J. (2011). *Engaging the online learner: Activities and Resources for Creative Instruction*. San Francisco, CA: Jossey-Bass.
- Collison, G., Elbaum, B., Haavind, S., & Tinker, R. (2000). *Facilitating Online Learning: Effective Strategies for Moderators*. Madison, WI: Atwood Publishing.
- Cornelius, S., Gordon, C., & Schyma, J. (2014). *Live Online Learning: Strategies for the Web Conferencing Classroom*. China: Palgrave Macmillan.
- Cornelius-White, J. (2007). Learner-centered teacher-student relationships are effective: A meta-analysis. *Review of Educational Research*, 77(1), 113-143.
- Datta, D. K., & Narayanan, V. K. (1989). A meta-analytic review of the concentration-performance relationship: Aggregating findings in strategic management. *Journal of Management*, 15(3), 469-483.
- De Freitas, S. & Neumann, T. (2009). Pedagogic strategies supporting the use of synchronous audiographic conferencing: A review of the literature. *British Journal of Educational Technology*, 40(6), 980-998.
- Hamm, J. V., & Faircloth, B. S. (2005). The role of friendship in adolescents' sense of school belonging. *New Directions for Child and Adolescent Development*, 2005(107), 61-78.

- Kearsley, G. (2000). *Online Education: Learning and Teaching in Cyberspace*. Belmont, California: Wadsworth/Thomson Learning.
- Knowles, M. (1980). *The Modern Practice of Adult Education: From Pedagogy to Andragogy* (2nd ed.). New York, NY: Association Press.
- Kumar, D. D. (1991). A meta-analysis of the relationship between science instruction and student engagement. *Educational Review*, 43(1) 49-61.
- Lehmean, R. & Conceição, S. (2010). *Creating a Sense of Presence in Online Teaching: How to "BE THERE" for Distance Learners*. San Francisco, CA: Jossey-Bass.
- Marzano, R. J. (2000). *A New Era of School Reform: Going Where the Research takes Us*. Aurora, CO: Mid-Continent Research for Education and Learning.
- Mayer, R. E. (2001). *Multimedia Learning*. New York, NY: Cambridge University Press.
- McBrien, J. L., & Jones, P. (2009). Virtual spaces: Employing a synchronous online classroom to facilitate student engagement in online learning. *International Review of Research in Open and Distance Learning*, 10(3), 1-17.
- Murphy, E., Rodriguez-Manzanares, M. A., & Barbour, M. (2010). Asynchronous and synchronous online teaching: Perspectives of Canadian high school distance education teachers. *British Journal of Educational Technology*, 42(4), 583-591.
- Roseth, C. J., Johnson, D. W., & Johnson, R. T. (2008). Promoting early adolescents' achievement and peer relationships: The effects of cooperative, competitive, and individualistic goal structures. *Psychological Bulletin*, 134(2), 223-246.
- Salmon, G. (2011). *E-moderating: The Key to Teaching and Learning Online*. Third Edition. Oxford: Routledge.
- Senge, Peter M. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York, NY: Doubleday.
- Steed, C. (2011). *Facilitating Live Online Learning*. Engaged Online Learning Ltd.
- Thormann, J. & Zimmerman, I. K. (2012). *The Complete Step-by-Step Guide to Designing and Teaching Online Courses*. New York, NY: Teachers College Press.
- Tu, C., & McIssac, M. (2002). The relationship of social presence and interaction in online classes. *American Journal of Distance Education*, 16(3), 131-150.
- West, J. & West, M. (2009). *Using Wikis for Online Collaboration*. San Francisco, CA: Jossey-Bass.
- Vai, M. & Sosulski, K. (2011). *Essentials of Online Course Design: A Standards-based Guide*. New York: Routledge.

What are the Opinions of Prospective Science Teachers Regarding the Use of Technology in Education?

Nagihan Tanik ÖNAL

*Department of Mathematics and Science Education,
Erciyes University, Faculty of Education, Turkey
nagihanta@gmail.com*

Nezih ÖNAL

*Department of Computer Education and Instructional Technology
Nigde Ömer Halisdemir University, Faculty of Education, Turkey
nezihonal@gmail.com*

Uğur BÜYÜK

*Department of Mathematics and Science Education,
Erciyes University, Faculty of Education, Turkey
ugurbuyuk@gmail.com*

ABSTRACT

With the consideration of the significant role teachers play in the use of technology in education, it is believed that addressing prospective teachers' needs in this regard during their teacher education program can be effective in equipping them with the essential skills and knowledge in the use of technology in education. Accordingly, the present study aimed to reveal the opinions of prospective science teachers as regards the use of technology in science education. To this end, the present study investigated prospective science teachers' stance towards novelties in the use of technology. The research design employed in the study was the phenomenology method of the qualitative research paradigm. The participants of the study were 51 prospective teachers, who were junior students majoring in Science Teacher Education at Erciyes University. The data collection tool utilized in the study was a document analysis form comprised of eight open-ended questions, which aimed to determine the participants' opinions regarding the use of technology in science classes. The findings which the data analysis yielded indicated that the participants exemplified the technologies used in education as the interactive board (f=43), the projector (f=41), the computer (f=41) and laboratory equipment (f=35). The participants explained that they planned to use these educational technologies in their classes mostly for concretizing abstract science topics by means of visualization (f=51) and to enable the students to engage in effective and permanent learning (f=38). The participants emphasized that the use of technology in science classes had such benefits as follows: enabling students to learn effectively and permanently (f=45), being time-saving for both the teachers and students (f=40), increasing students' motivation toward the subject (f=32), and facilitating students' access to knowledge. On the other hand, the participants believe that the use of technology in the lessons has such limitations as the requirement of preparation before class (f=41), the difficulty of popularizing it to every school (f=37), and the disruption of classes when potential technical problems such as power cut was encountered (f=25). Accordingly, it can be maintained that the participants were of the opinion that overall the use of technology in education increased the quality of education and facilitated teaching despite the existence of limitations.

Keywords: Science, prospective teachers, the use of technology in education, phenomenology

INTRODUCTION

As a result of rapid developments in science and technology in the world today, technology is existent all spheres of life. A highly comprehensive phenomenon, educational technologies is one of the areas that resulting in significant changes (MoNE, 2005). It can be stated that we are currently living in an era in which the integration of technology in education is considered important.

The integration of technology is essential in all disciplines of education, including the science course. In fact, it can be stated that the integration of technology is particularly important in science courses so much so that the name of the science course, the curriculum of which was renewed in 2005 and based on a student-centered educational approach, was changed to “Science and Technology” (MoNE, 2005). Subsequently, its name was changed to “Science”; however, technology retained its importance in the science course curriculum. One of the goals of the course in this program was defined as raising awareness regarding the impact of science on society and technology and the impact of society and technology on science (MoNE, 2013). When we examine the related literature is examined, we encounter a new discipline named as “Educational Technology”, formed from the combination of education and technology. However, this discipline can sometimes be perceived solely as equipment in education research and by stakeholders in education. However, according to Alkan (1998), educational technologies mean the planning of the educational process, and the implementation, evaluation and development of the educational plan.

Real objects, models, multimedia tools, written and printed materials and technological devices are among the primary products of educational technologies. What needs to be paid attention to at this point is that “education technologies” and “technology in education” are used interchangeably in literature. The use of educational technologies in teaching has such strengths as providing the opportunity to engage in individual learning, to function as a channel for individuals’ effective and permanent learning, and facilitating communication between teachers and students and the parents (İşman, 2002). In addition, Roblyer and Edwards (2005) stressed that the use of technology in education contributes to students’ motivation and abilities, increases teachers’ efficiency, supports new teaching methods and techniques and that it is a requirement of the information age. From this respect, as in all other disciplines, it is possible to say that how important the use of technology is in the discipline of science education, which is the focus of the present study. The effective use of technology in education can only be realized by means of teachers equipped in this area (Özden, Çağıltay and Çağıltay, 2004). Studies conducted in the related area have indicated that the successful use of technology in education is associated with teachers’ willingness to adopt and use technology (Christanse, 2002; Hew & Brush, 2007; Pierson, 2001). Hence, throughout their course of education, prospective teachers need to acquire the knowledge and ability to use technology in education and possess a positive pedagogical attitude towards technology. Thus, revealing the views of prospective teachers regarding the use of technology in education is considered to be important in shaping the education to be provided.

Prospective teachers’ opinions regarding the use of technology in education have an influential effect on their topic-related practices when they start to pursue their teaching profession (Ertmer, 2005). Moreover, when prospective teachers of today become teachers, they will come face to face with student groups who are individuals of the digital age. These students’ expectations and needs can only be met if they develop themselves. When Dewey says, “If we educate the children of today with the methods of the past, we will steal from the future,” he states with a single sentence the necessity to realize an education appropriate to the present era.

With the consideration of the significant role teachers play in the use of technology in education, the present study, conducted with prospective teachers whose needs can be met during their teacher education program by equipping them with the essential skills and knowledge in the use of technology in education, aimed to reveal the opinions of prospective science teachers regarding the use of technology in science education. To this end, the present study investigated the stance of prospective science teachers in relation to the use of technology.

The research question of the present study was stated as “What are the opinions of prospective science teachers in relation to the use of technology in science education?” The sub-research questions to which answers were sought are as follows:

- i. What technologies can be used in science classes according to the views of prospective teachers?
- ii. What are prospective teachers’ opinions regarding the use of technology in science classes?
- iii. What are prospective science teachers’ opinions about the strengths of using technology in science education?
- iv. What are prospective science teachers’ opinions about the weaknesses of using technology in science education?

THE STUDY

The Research Design

The research design which the present study employed was the method of phenomenology within the paradigm of qualitative research. In phenomenology research designs, participants describe their experiences regarding a certain phenomenon (Creswell, 2013). That is to say, in the present research design, the researcher focuses on the participants' individual experiences to reveal the participants' perceptions and the meanings they attribute to phenomena (Yıldırım and Şimşek, 2008).

Participants

The participants of the study were selected via criterion sampling, which is one of the purposive sampling methods. Purposive sampling methods emerge in the qualitative research approach and is a sampling method which enables information-rich situations information to be examined profoundly (Patton, 2002). As the phenomenon under investigation in the present study was opinions regarding the use of educational technology in science classes, prospective science teachers, who were believed to have related experience in the mentioned area, were selected as the participants of the study. The criterion sampling method was used to select junior science teacher education students. The criterion that was utilized to determine the participants was the requirement of having completed the "Teaching Technologies and Materials Design" course. Accordingly, 51 prospective teachers in their junior year in the Science Teacher Education department at Erciyes University participated in the study.

Data Collection and Analysis

A document examination form comprised of eight open-ended questions was used as the data collection tool in the study. The document form, which assumed its final form after it was piloted, was administered to the participants, who were asked to respond to the questions sincerely. The essential measures were taken to prevent any distractions of the participants during the applications. The data obtained in the study were analyzed using the content analysis method. The aim of a content analysis is to reveal the concepts and relationships that can explain the data. To this end, the data should initially be conceptualized, and then be logically organized according to the emerging concepts and finally the themes explaining the data should be identified (Yıldırım and Şimşek, 2008).

FINDINGS

According to the findings obtained from the data analysis, it can be stated that the participants defined educational technologies as technologies used in education to support education and facilitate instruction (f=47). In addition, the participants exemplified the technologies used in education in the following order of frequency: the interactive board (f=43), the projector (f=41) and laboratory equipment (f=35). The prospective teachers stated that they frequently used the mentioned technological products in their university education.

The participants explained that they made use of educational technologies in their courses mostly to concretize abstract science topics by means of visualization (f=51) and would prefer to use them with the aim of enabling students to learn effectively and permanently (f=38). The prospective teachers stated that they could make use of technologies in every stage of their science classes, specifically during the warm up/introduction/presentation stage of the lesson to raise interest and curiosity among the students (f=29), and during the development stage of the lesson to concretize abstract topics (f=44).

The participants emphasized the beneficial aspects of the use of technology in science class as ensuring effective and permanent learning in students (f=45), being time saving for both teachers and students (f=40), increasing students' motivation towards the lesson (f=32) and facilitating students' access to information and knowledge (f=19). On the other hand, the participants believed that the use of technology in classes entailed some handicaps, such as the necessity for pre-lesson preparation (f=41), the difficulty to popularize it to all schools (f=37), and the interruption of classes with the emergence of potential technical problems (such as power cuts) (f=25).

CONCLUSIONS

Throughout their undergraduate education, prospective teachers should continuously be familiarized with novel technological products related to their own field of discipline and they should be provided with the opportunity to use them actively. According to the findings of a study by Lane and Lyle (2010), as technological expertise in the use of educational technologies is an important variable, it was stated that particularly teachers should develop themselves in this respect and follow up on technological developments. Ensuring that prospective teachers understand the importance of this situation before they start to pursue their teaching profession will facilitate their teaching endeavors.

Similar findings were reported in another study by İnel, Evrekli and Balım (2011) in which prospective teachers' opinions regarding the use of technology in the science and technology were examined. All of the prospective teacher in their study expressed the benefits of using educational technologies in learning environments. In another study, conducted by Akpınar, Aktamış and Ergin (2005), students' opinions related to the use of educational technology in science classes were examined. The researchers of the same study recommended that educational technology tools should frequently be utilized in science classes, that opportunities for educational technology tools should be enhanced and that they should be equipped with technological tools.

In conclusion, as a result of the findings that the present study yielded, it can be stated that prospective teachers are of the opinion that despite its limitations, the use of technology increases the overall quality of education and facilitates teaching. Based on their opinions, it is evident that when the target population start to pursue their teaching profession, they will be willing to actively use the technologies that they learned and used during their undergraduate education. Consequently, technological facilities at universities should be expanded to provide grounds for prospective teachers to make active use of these technologies. In this way, prospective teachers can display a positive attitude towards the use of technology which they already know how to use in their professional life.

REFERENCES

- Akpınar, E., Aktamış, H., & Ergin, Ö. (2005). Fen bilgisi dersinde eğitim teknolojisi kullanılmasına ilişkin öğrenci görüşleri. *TOJET: The Turkish Online Journal of Educational Technology*, 4(1), 93-100.
- Alkan, C. (1998). *Eğitim teknolojisi*. Ankara: Anı Yayıncılık.
- Christanese, R. (2002). Effects of technology integration education on the attitudes of teachers and students. *Journal of Research on Technology in Education*, 34(4), 411-434.
- Creswell, J. W. (2013). *Research design*. Thousand Oaks, CA: Sage.
- Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration?. *Educational Technology Research and Development*, 53(4), 25-39.
- Hew, K., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), 223-252.
- İnel, D., Evrekli, E., & Balım, A. G. (2011). Öğretmen adaylarının fen ve teknoloji dersinde eğitim teknolojilerinin kullanılmasına ilişkin görüşleri. *Kuramsal Eğitim Bilim Dergisi*, 4(2), 128-150.
- İşman, A. (2002). Sakarya ili öğretmenlerinin eğitim teknolojileri yönündeki yeterlilikleri. *The Turkish Online Journal of Educational Technology*, 1(1), 72-91.
- Lane, C. A. & Lyle, H. F. (2010). Obstacles and supports related to the use of educational technologies: the role of technological expertise, gender, and age. *Journal of Computing in Higher Education*, 23(1), 38-59. DOI:10.1007/s12528-010-9034-3.
- Milli Eğitim Bakanlığı (2005). *İlköğretim fen ve teknoloji programı*. Talim Terbiye Kurulu: Ankara.
- Milli Eğitim Bakanlığı (2013). *İlköğretim fen bilimleri programı*. Talim Terbiye Kurulu: Ankara.
- Özden, M. Y., Çağıltay, K. & Çağıltay, E. (2004). *Teknoloji ve eğitim: Ülke deneyimleri ve Türkiye için dersler*. İstanbul.
- Patton, M. Q. (2002). *Qualitative evaluation and research methods. (Third Edition)*. Thousand Oaks, CA: Sage Publication.
- Pierson, M. E. (2001). Technology integration practice as a function of pedagogical expertise. *Journal of Research on Computing in Education*, 33(4), 413-430.
- Roblyer, M., & Edwards, J. (2005). *Integrating educational technology into teaching (4th Ed.)*. Upper Saddle River, NJ: Prentice-Hall.
- Yıldırım, A. ve Şimşek, H. (2008). *Sosyal bilimlerde nitel araştırma yöntemleri. (5. Baskı)*. Ankara: Seçkin Yayıncılık.

Microlearning: A Pedagogical Approach for Technology Integration

Emtinan ALQURASHI

Temple University

Philadelphia, Pennsylvania, USA

alqurashi@temple.edu

ABSTRACT

Microlearning refers to a learning strategy designed using a series of short learning content and short activities that makes a mini course. This paper discusses the main three elements in creating an effective microlearning environment, which are: content pedagogy, and technology. It explores the knowledge of how carefully-selected content can be a successful element in microlearning. It also discusses the characteristics and the design of a micro content, and finally explores the most common technologies used nowadays for microlearning.

Keywords: microlearning, online learning, instructional technology

INTRODUCTION

Microlearning refers to a learning strategy designed using a series of short learning content and short activities that makes a mini course. It is also called bite-sized learning because it utilizes small, well planned, bite-sized chunks of units or activities (Hug, 2005). It is designed to suit the limits of the human brain with respect to its attention span and avoid cognitive overload. Although the concept of micro teaching existed for a long time, the term microlearning has not been used until a decade and a half ago (Hierdeis, 2007) and research that support the integrating technology to create microlearning environments is still growing in the field of higher education.

According to Hug (2006), there are seven dimensions of microlearning: time, content, curriculum, form, process, meadiality, and learning type. They describe mainly the design aspect of microlearning. Although the design aspect is very important, but they lack the pedagogy and technology aspects, which are key elements to an effective microlearning design. This paper argues that the main three elements in creating an effective microlearning environments are content pedagogy, and technology as shown in Figure 1.

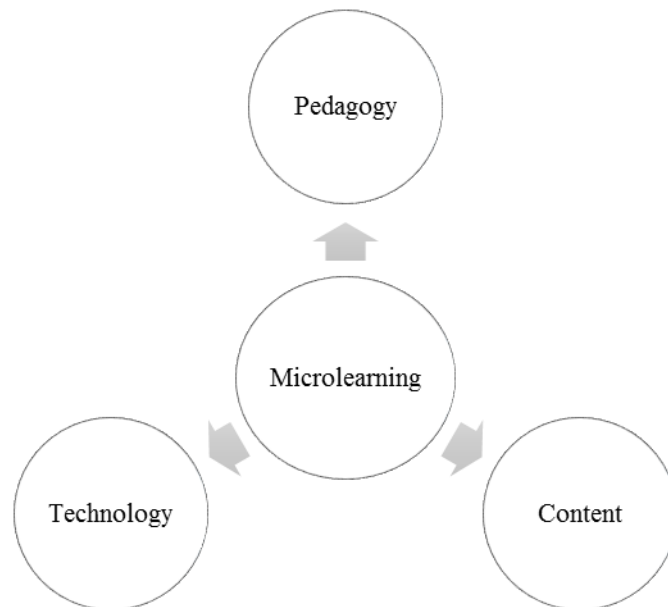


Figure 1. Microlearning model

Research conducted to investigate the opportunities of integrating technology to create microlearning environments is still at its infancy, and it focuses heavily on corporate training and adult learning. Research on higher education is very limited though. In higher education for example, a study by Liu, Z., Wei, L., Gao, X. (2016) found that 80% of college students took active part in teaching activities. They stated “it promotes multi-dimension interaction and increases deep-levelled cooperation and understanding” (p.870). The researchers also found that microlearning environments inspired and improved the learning environment itself and students’ interest in learning. Zhamanov (2013), started to implement microlearning technique in their university course and also received positive feedback from students. Students expresses higher level of interests to learn the subject matter, and the amount of materials learned has increased compared to previous years.

Results from a study by Bruck, P. A., Motiwalla, L., & Foerster, F. (2012) with a university level course and two governmental training courses showed that learners had good satisfaction levels and high usage levels for the course materials. Similar results by Aitchanov, et. al. (2013), who examined the use of Twitter, a social media technology, in a microlearning technique for educational purposes. They collected data from college students enrolled in Advanced Programming in C++ course, and found that the majority of them enjoyed learning the course materials when it was delivered in small chunks using Twitter. However, Students suggested that they would like the number of tweets to be increased, and to implement this technique to learn other spheres. Kovachev, D., Cao, Y., Klamma, R., & Jarke, M. (2011) explored bilingual vocabulary learning, and they found “promising results in enhanced flexibility in personal learning content creation and increased efficiency in filling knowledge gaps” (p. 51).

Wang (2017), investigated the effect of delivering the Engineering Mechanic Experiment content in short sequenced videos. As a result, the author reported that “the engineering mechanics experiment grade of undergraduate has improved significantly, the service efficiency of mechanical equipment and degree of familiarity has improved sharply” (p. 130). The design of those short videos, however, resulted to limited student-student and student-instructor interaction. Interaction with the digital content in this case is the highest.

In terms of evaluations, Giurgiu (2017) assessed whether students respond better to evaluation questions when they watch small segments of content followed by a number of evaluations, or when they watch large amounts of content with fewer evaluations. Findings suggest that smaller chunks of content helped students to better retain information and better perform in end-of-course test. Students who learned through microlearning technique took 28% less time to answer their evaluations and did 20% better, took three times less to cover the course materials compared to students who did not. This suggests that trying to learn large content at once result to little interaction with content.

CONTENT

The first element in creating a microlearning environment is content. It is necessary to identify areas in curriculum where technology integration is appropriate for microlearning units and activities. For example, introducing the concept of regression analysis in a statistics lesson. Students can learn the concept by a microlearning technique, then apply that knowledge in the classroom. In order to choose appropriate content for microlearning, the following questions should be considered:

- What do I want my students to know and understand in order to move forward?
- What is worth my students’ time outside of classroom?
- What are the most common mistakes students do that affect their learning and their grades?
- What topics do I think that can be broken down into small pieces?
- What are the 3 or 4 most important things I want my students to learn?

These are just some example questions to ask for choosing appropriate content. Once content is identified, it is essential to think about the pedagogical model to use and the design of the microlearning environment.

Moore & Kearsley (1996) emphasized the importance of learner interaction with content in online learning environments. A recent study by Alqurashi (2017), explored the relationship between four predictor variables (online learning self-efficacy, learner-content interaction, learner-instructor interaction, and learner-learner interaction) and student satisfaction and perceived learning. Results indicates that all four predictor variables together significantly predict student satisfaction and perceived learning.

Learner interaction with the content in an online learning environment was the strongest and most significant predictor of student satisfaction, where self-efficacy was the strongest and most significant predictor of perceived learning. This suggests that developing and enhancing learner interaction with content as well as boosting student's confidence in their capabilities to learn the content in a digital environment should be main focus of instructors.

PEDAGOGY

Baumgartner (2013) discusses the theory behind microlearning and proposes a model of a competence spiral to scaffold students' learning. In the first phase called Learning I, students absorb knowledge; this knowledge is basic and has no meaning yet (relates to behaviorism). In the second phase called Learning II, students acquire knowledge. Students in this phase interact with artificial environments and make their own experiences. Learning here in active with meaningful feedback is provided by the instructor (relates to cognitivism). In the third phase called Learning III, knowledge is constructed where instructors and students work together to master the course materials (relates to constructivism). In Learning I+, students proceed to higher level with more advanced concepts. Based on the Baumgartner's model, Göschlberger (2016) proposed a social microlearning platform designed for all four phases. In Learning I, students create and share microlearning content. In Learning II, students evaluate, rate and improve the microlearning content. In Learning III, students are able to tag and collect content items. Learning I+, students interact with the microlearning content and solve low stakes quizzes, which they can take repeatedly to help them learn the materials.

Microlearning can be implemented as a flipped classroom. This means that learners can complete microlearning activities before class time, which can be the first and the second phase in Baumgartner's model; class time can be used to apply knowledge, discuss ideas, and master the concepts. This can be the third and fourth phase in Baumgartner's model. Microlearning can also be implemented as a supplement to classroom instruction. Learners can be asked to complete microlearning modules, units and activities after class time to solidify concepts. This can be done for both traditional and online classes.

Another important element to consider when using the microlearning technique is what are the characteristics for designing and creating an effective digital-based microlearning environments. First, learning in small units. Learning content is created in digital format (e.g. short videos, podcast, animation). Each short segment of content takes the learner about 2-4 mins to complete. Those segments can be followed by short check-for-understanding or low-stakes quizzes. Second, length. The total amount to complete all segment of content in a microlearning environment does not take more than 15 to 20 min for learners to complete at a time. By doing this, it makes us think about what are the must-to-know information, and what are the ok-to-eliminate information. Third, a single learning outcome. By breaking down your large topic into smaller units, the microlearning segments should focus on just one specific learning outcome. What is the one desired result that you want your students to achieve after being in the microlearning environments.

If students were introduced to a well-designed microlearning environment, this can help enhance student's confidence in their capabilities to learn the content in a digital environment (i.e. high self-efficacy). Alqurashi (2016, 2017) argues that self-efficacy in learning online is very critical to students' learning. However, there is a need for research to be done in higher education. The focus of research in the past was mainly on technology self-efficacy (Alqurashi, 2016). Although technology skills are important, it is important to consider how new generations of learners have changed in terms of their fluency with technology.

TECHNOLOGY

Technology plays an important role in microlearning. It can be used to engage students outside of classroom if implemented well. The challenge with technology is that it is a fast-growing industry, sometimes it is hard for instructors to keep up along with all other teaching and non-teaching responsibilities. Knowledge of technology was often recorded to be the lowest compared to instructors' self-reported knowledge of content and pedagogy (Alqurashi, Gokbel, & Carbonara, 2016). Although, there is a technology challenge that comes with microlearning, the potential of it looks very promising.

In a microlearning, it is important to think about appropriate choice of technology to design based on microlearning characteristics. The most common microlearning tools used today include Coursmos, Grovo, Panopto.

Coursmos (Coursmos, 2017). It is an online platform that allow the creation of micro course used to create mini lessons, followed by quizzes. The micro course can include seven micro lessons, up to 5 minutes long each as shown in Figure 2. Coursmos has an intelligent and personalized course recommendation system, which recommends other courses created by other instructors to watch that are related to their course content. It connects micro courses form a knowledge cloud, and allow to share the micro course on any social media or website. It is a quick learning tool that allow students to complete micro lessons using their mobile devices, and it allows instructors to track students' attendance and learning progress.

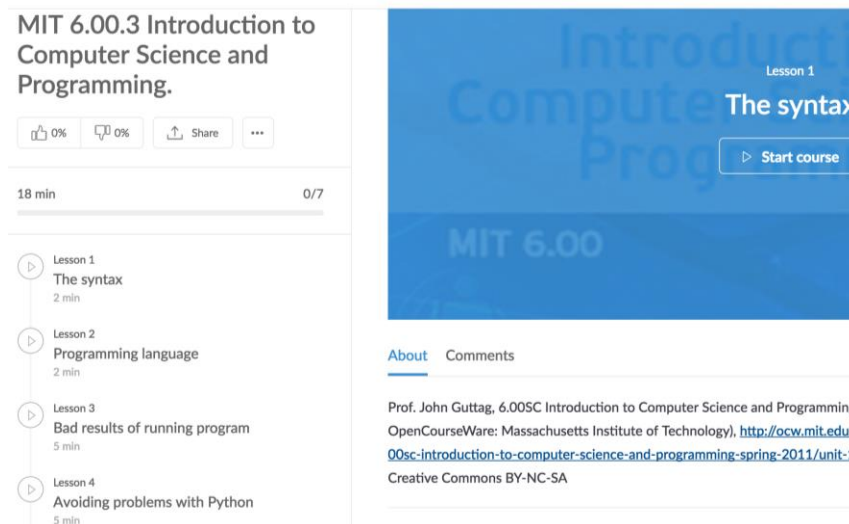


Figure 2. Example of a Coursmos micro course

Grovo (Grovo, 2017). It is online microlearning platform as shown in Figure 3. In Grovo, mini lessons are typically up to 90 seconds long, which allows learners to quickly complete a mini course assigned to them. Each lesson combines video, gifs, quizzes, and other engaging activities to keep learners on task. The platform can be integrated into different learning management systems for easy access, and include ready-made templates to create micro content. Instructors can monitor students' progress, identify at-risk students. This can be presented with graphs to view learning analytics.

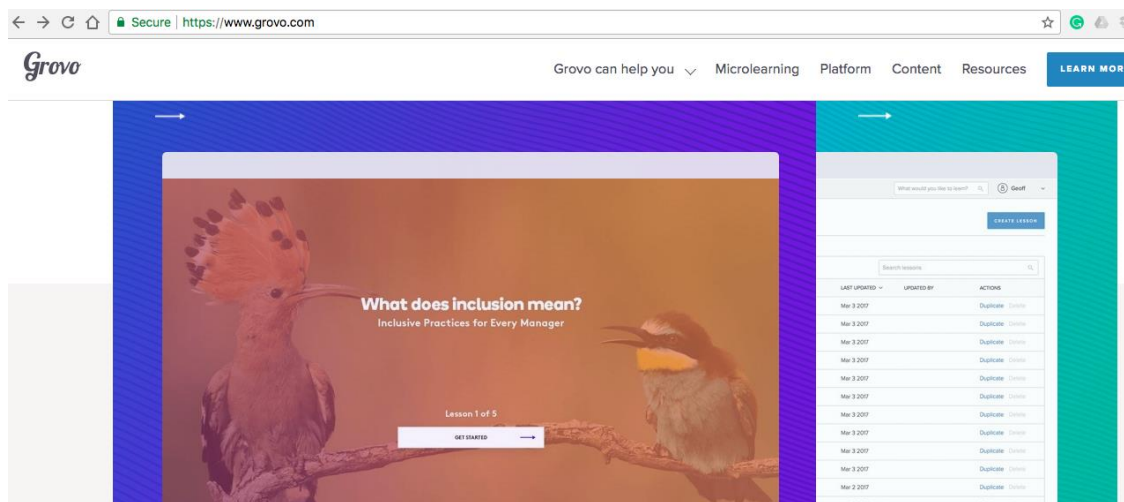


Figure 3. Example of a Grovo micro course

Panopto (Panopto, 2017). It is a video content management system that provides lecture recording, screencasting and video streaming to create microlearning environment as shown in Figure 4. It allows the integration of the system in learning management systems for instructors and students. Panopto system allows instructor to transcript their videos with a click to make accessible, and allows for creating interactive video quizzing. It also provides instructors with detailed reporting of student progress and performance, and identify where students are spending the majority of their time reviewing.

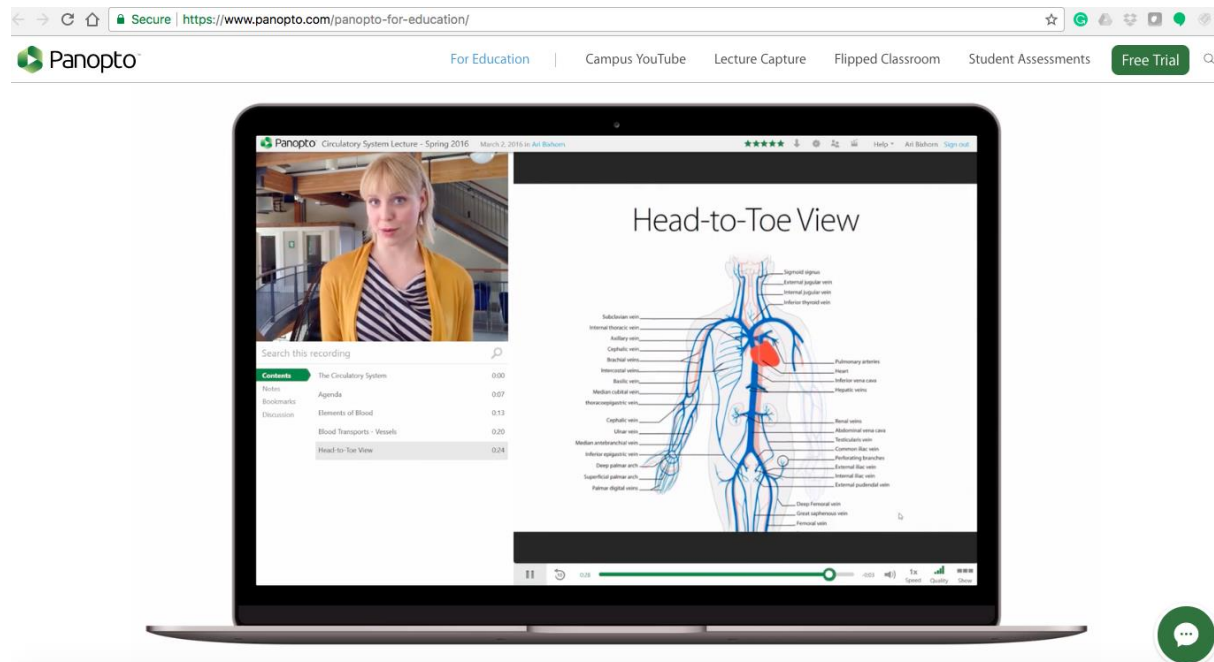


Figure 4. Example of a Panopto micro course

Many of the technologies used in the classroom nowadays are mobile friendly, as more and more students have access to mobile devices and use them to access course content. For this reason, digital microlearning environments should be mobile friendly, to allow learners to complete learning activities on the go whenever they feel like it. The integration of mobile devices to create microlearning environments was discussed by Hug (2010). He emphasized on the importance of mobile devices because many reasons: (1) content displayed on mobile devices is usually a microcontent, (2) attention span and time periods are relatively short when presented on mobile devices, (3) a screen size in a mobile device is smaller than other devices, (4) mobile devices allow the design of micro-steps in formal and informal learning environments, (5) mobile devices allow the microlearning environment to be mobile, physical and social, and (6) finally mobile devices are often associated with microplatforms.

CONCLUSION

The microlearning model ensures that students are engaged in the online content outside of classroom, more research is needed to understand if it leads to higher levels of perceived learning as well as satisfaction. It does help usually distracted individuals to learn in short focused micro content. Instructors must also focus on the learning experience in the big picture when implementing microlearning. The application and the construction of knowledge that occur in class after students complete their microlearning content outside of class. By including all elements of microlearning (i.e. content, pedagogy, and technology), it can increase student engagement, enhance student satisfaction, and positively impact the learning experience.

REFERENCES

- Aitchanov, B., Satabaldiyev, A., & Latuta, K. (2013). Application of microlearning technique and Twitter for educational purposes. *Journal of Physics: Conference Series*, 423, 1-4. Doi: 10.1088/1742-6596/423/1/012044
- Alqurashi, E. (2016). Self-Efficacy In Online Learning Environments: A Literature Review. *Contemporary Issues In Education Research (CIER)*, 9(1), 45-52. Doi: 10.19030/cier.v9i1.9549
- Alqurashi, E. (2017). Self-Efficacy and The Interaction Model as Predictors of Student Satisfaction and Perceived Learning in Online Learning Environments (Unpublished doctoral dissertation). Duquesne University, Pittsburgh, PA, USA.
- Alqurashi, E., Gokbel, E. N. and Carbonara, D. (2016), Teachers' knowledge in content, pedagogy and technology integration: a comparative analysis between teachers in Saudi Arabia and United States. *British Journal of Educational Technology*. Doi:10.1111/bjet.12514
- Baumgartner, P. (2013). Educational dimensions of microlearning—towards a taxonomy for microlearning. In: *Designing Microlearning Experiences—Building up Knowledge in Organisations and Companies*. Innsbruck University Press, Innsbruck.
- Bruck, P. A., Motiwalla, L., & Foerster, F. (2012). Mobile learning with micro-content: a framework and evaluation. *25th Bled eConference*. Retrived from www.bledconference.org.
- Coursmos. (2017). Retrieved from <https://coursmos.com>
- Giurgiu Luminița. (2017). Microlearning an Evolving Elearning Trend. *Buletinul Științific Al Academiei Trupelor De Uscat*, 22(1), 18-23. Doi: 10.1515/bsaft-2017-0003
- Göschlberger B. (2016) A Platform for Social Microlearning. In: Verbert K., Sharples M., Klobučar T. (eds) *Adaptive and Adaptable Learning-EC-TEL 2016*, (9891), pp. 513-516. Springer, Cham. Doi: 10.1007/978-3-319-45153-4_52
- Grovo. (2017). Retrieved from <https://www.grovo.com>
- Hierdeis, H. (2007). From Meno to Microlearning: A Historical Survey. In Hug, Th. (Ed.), *Didactics of Microlearning. Concepts, Discourses and Examples*, 35–52. Münster, Germany: Waxmann.
- Hug, T. (2005). Micro learning and narration: exploring possibilities of utilization of narrations and storytelling for the design of “micro units” and didactical micro-learning arrangements. In: *Proceedings of Media in Transition*, MIT, Cambridge, MA.
- Hug, T. (2006). Microlearning: A New Pedagogical Challenge (Introductory Note). In: Hug, Theo; Lindner, Martin; Bruck, Peter A. (eds) *Microlearning: Emerging Concepts, Practices and Technologies after e-Learning*. *Proceedings of Microlearning 2005*. Innsbruck: Innsbruck University Press.
- Hug, T. (2010). Mobile Learning as 'Microlearning'. *International Journal of Mobile and Blended Learning*, 2(4), 47-57. Doi: 10.4018/jmbl.2010100104
- Kovachev, D., Cao, Y., Klamma, R., & Jarke, M. (2011). Learn-as-you-go: new ways of cloud-based micro-learning for the mobile web. In *Advances in Web-Based Learning-ICWL 2011*. 51-61. Springer Berlin Heidelberg.
- Liu, Z., Wei, L., Gao, X. (2016). A Study on Self-regulated Micro-course Learning and Implicitly Layered Flipped Classroom. *Theory and Practice in Language Studies*, 6(4), 870-877. Doi: 10.17507/tpls.0604.27
- Moore, M., & Kearsley, G. (1996). *Distance education: A systems view*. New York, NY: Wadsworth.
- Panopto. (2017). Retrieved from www.panopto.com
- Wang, Z., Luo, Y., & Qu, Y. (2017). Application of Micro-lecture For Engineering Mechanics Experimental Teaching. *International Journal of Innovation and Research in Educational Sciences*, (4)2. 130-132.
- Zhamanov, A., & Zhamapor, M. (2013). Computer Networks teaching by microlearning principles. *Journal of Physics: Conference Series*, 423(1), 6. Doi: 10.1088/1742-6596/423/1/012028

Evaluating the Leadership Behaviours of the School Principles According to Teachers' Work Satisfaction

Behcet ÖZNACAR

behcet.oznacar@neu.edu.tr

Near East University, North Cyprus

Ercan SÜSLÜ

ercansuslu56@gmail.com

ABSTRACT

This study aims to search the effects of the school principals' leadership behaviours on the teachers' work satisfaction. The study group of the study consisted of 40 class teachers working in the official primary schools in the district of Batman province center. This research reposes the qualitative research method. In this research, the effects of school managers' leadership behaviors on job satisfaction of teachers were investigated and the findings were analyzed by NVIVO qualitative data analysis program. As a result of the research, it has been determined that the school administrators are a good leader, the teachers will improve their loyalty to the school and feelings of belonging. It has been seen that the fairness of the school administrators will increase the job satisfaction in the teachers. Job satisfaction has been shown to increase job loyalty among employees. Leadership behaviors directly affect teachers' job satisfaction at the point of reaching the institutional goals of school administrators, and those who are satisfied with their work are more productive in organizational structure.

Keywords: Education, Teacher, Manager, Leadership, Work Satisfaction.

INTRODUCTION

Leadership is the process of influencing and directing someone else's activities to achieve specific personal or group goals under certain circumstances (Ünal, 2012). Leadership is defined as "a process carried out by managers, guiding their members, aiming at achieving positive outputs for organization and customers through organizational change" (Kan ve Parry, 2004). According to another definition, leadership is expressed as the ability of a group or organization to correctly affect people in the direction of their goals and to create a common goal (Ehtiyar ve Tekin, 2011). When the definitions made about the concept of leadership are examined and a synthesis is formed with these definitions, the concept of leadership; We can define a group of people to be able to collect around these determined goals, to mobilize, to accumulate the abilities and knowledge to realize certain purposes (Ünal, 2012).

Leadership also includes influencing individuals and obtaining results. Leadership research has shown that if the leader is concentrated in one of these two areas is negligible, it will have negative consequences (Çirpan, 2013). It is very important for the leader to adopt the aims of the organization and to establish a healthy communication system (Can, 2013). In order for the organization to be successful and sustainable, the productivity of its employees as well as the satisfaction they receive from their colleagues and their work are of great importance (Varışlı, 2010).

It is known that there are people who do not have leadership skills when they are good managers. Not every manager is a leader. Although management can be learned by taking a number of trainings afterwards, leadership is in people with innate hardware features. The manager should also be selected from those who have leadership attributes at the same time. Because the managers must be good leaders at the same time. In this way, they can be more effective in directing employees, achieving the goals of the institution, and showing high performance of employees.

Leaders evolve in a way that has leadership and directional characteristics, and can not be trained later. Leaders bring leadership roles and skills to birth. Based on a lot of research done, it can be said that leadership comes from birth, and the leader is not raised afterwards (Aydn, 2010).

School administrators, composed of principals and assistant principals, can be defined as those who organize, direct, plan, coordinate and supervise their employees so that they can fulfill their goals (Gürsel, 2013).

School administrators need to be aware of their specific competencies and authority and responsibilities. School administrators should be able to plan the future of the school with their knowledge and skills they possess, manage school changes and make changes in schools. Schools need to have the knowledge and skills necessary to enable the school administrators to achieve the necessary effectiveness in the activities to be held at schools (Özdemir, Sezgin ve Kılıç, 2015).

The role of instructional leadership, in which school administrators have a decisive qualification in many dimensions as well as in other dimensions, is critical. One of the main objectives of the school is to prepare the survivors with an effective, lasting and meaningful learning experience (Ekinçi ve Özdaş, 2011).

The inclusion of teachers in the decision-making and implementation processes of the events being held will also affect teachers' job satisfaction positively as they will create a sense of responsibility and belonging to the teachers.

On the other hand, the election of the school administrators from the teachers also has some troubles. One of the obstacles to the transformation of school management into a profession can be explained as follows: In the current situation, school administrators' choice is among the teachers in the schools. In other words, school administrators' bases and resources are teachers. At the conclusion of the current practice, the idea is that the element that is the main element in schools is the front plan. As a result, the assumption that the profession is the profession of the school is an obstacle to the thinking of school management as a profession and prevents the school administrators from running their work properly (Süslü, 2015).

Instead of being elected from among the teachers, the school administrators have taken the necessary trainings and have absorbed the concepts of leadership of the education and school administration and at the same time the education administrators are not in one dimension. Will make sense.

Job satisfaction is the satisfaction of the material gains achieved by working together with colleagues for a certain period of time and the conclusion of a concrete product as a result of the work (Eren, 2010). Job satisfaction can be expressed in the form of a set of behaviors specific to individuals employed by the same institution (Kantar, 2010). Job satisfaction is the positive emotional state that arises as a result of the responsibility of the employee involved in the business or of having a positive working life (Özcan, 2011). Job satisfaction can be explained in terms of employees' satisfaction with working in a job they desire or their job (Yücel ve Demirel, 2013).

It is very important for the employee to spend a great part of his life. Since there is a concept that is important in terms of job satisfaction, productivity and happiness of employees, a lot of research has been done about the subject. In order to be able to get the expected productivity from the work done, it is necessary for the employees to take ownership of the work. At the same time, meeting the expectations of employees will also increase productivity. Job satisfaction, which is an emotional situation, is also of great importance in increasing productivity. Ensuring employee job satisfaction is also important both for the employer and for the continuity of the workplace.

It is also important for the development of the country to be given the necessary adherence to education and education. The increase in the number of teachers to be trained should primarily be attempted to increase the productivity of teachers who constitute the basic building block of education.

There are many factors that affect the productivity of the teacher. One of them is job satisfaction. A teacher who is satisfied with his work will take more responsibility in educating younger generations. This will indirectly lead to a quality education of well-trained younger generations who will build the future of the country. Many factors such as teachers' problems, fees, inspection system, intra-institutional relations that the teacher works with in addition to their personal situation have a direct impact on the motivation of the teachers (Barlı, 2005).

It is important for school administrators to take measures to reduce the most internal problems and to create situations encouraging the establishment of a healthy communication network among the school management and the employees and to create situations related to this issue in terms of organizational commitment and job satisfaction. At the same time, as the Ministry of National Education, the reordering and fair implementation of teachers' wage, inspection and promotion conditions is also very important in terms of job satisfaction.

The level of job satisfaction of teachers is important in terms of increasing the quality of education and providing a good education for the schools. Teachers who are directly influenced by the working environment and working conditions in the realization of education and training activities will feel comfortable and school administrators will work in an environment where the teachers are considered valuable and their opinions are not asked not with the understanding of printing but will increase their performance and contribute to being more productive.

The school administrator will increase the motivation of teachers to use an effective communication language instead of a rigorous discipline approach to fulfill school affairs. It is easier for a well-motivated teacher to succeed. The job satisfaction level of a successful teacher is also high.

METHODOLOGY

This research was based on qualitative research methods. The qualitative data collection techniques such as qualitative research, naturalistic sensitivity, participant role of researcher, holistic approach, revealing perceptions, resilience in research design, inductive analysis and qualitative data and observation, interview and document analysis are mentioned as researches (Yıldırım ve Şimşek, 2013). Understanding of perception, attitudes and processes is better achieved in qualitative research (Ersoy ve Yalçınoglu, 2014).

Participants

The study group consisted of 40 classroom teachers working in official primary schools in Batman province Central district during 2015-2016 Education period.

Data Collection Instruments

In this study, a semi-structured interview form consisting of five questions was used to collect data. The interview form for the collection of research data was prepared so that the leadership behaviors of the school administrators can influence the evaluation of the teachers' job satisfaction. The scale was applied to the teachers who worked in the primary schools affiliated to Ministry of National Education of Republic of Turkey during 2015-2016 Education period. Before the application, participants were informed about the purpose of working with the participant.

While this interview form was being formulated, similar studies that had been done before were examined carefully and the questions were determined as appropriate for the purpose and purpose of this research. The developed interview form was reviewed by the experts of the job and then the necessary correction process was applied and the form was applied. In the interview form, can you tell your class teachers, "What are your thoughts on the situation between the school administrators' leadership behaviors and the organizational commitment in the school (feelings of belonging, emotional attachment, etc.) ?, leadership behaviors of the school managers (justice, communication, body language etc.) Can you explain your views ?, Can you explain your views about establishing a healthy communication network between school administrators and employees and ensuring the job satisfaction of employees ?, What are your opinions about the behaviors of the school administrators to feel the commitment to the organization and increase your work efficiency ?, Leadership behaviors of school administrators Can you explain your views on the impact on corporate values and targets? ". The creation of a healthy environment based on mutual trust in which participants can express their views in a relaxed manner is important for giving more sincere and sincere answers to the questions posed (Yıldırım ve Şimşek, 2013).

In order for participants to feel comfortable, interview times are made at appropriate times for both the investigator and participants.

Data Analysis

In the analysis of collected data, content analysis was used from qualitative data analysis varieties. NVIVO qualitative data analysis program was used in analyzing the data obtained in the research. With the NVIVO program, content can be easily coded and complex information is simply organized. In the study, it was preferred to quantify and interpret the data obtained in the light of the determined aims. Quantification of qualitative data is the process of passing data over certain processes into figures. These processes; Interviews, observations, or the examination of a document (Yıldırım ve Şimşek, 2008).

One of the issues that researchers should pay attention to in qualitative research is that researchers should keep their assumptions, feelings, thoughts and prejudices apart from the information they obtain. Researchers should use their opinions in the interpretation section after the collected data are analyzed. The creation of an environment based on mutual trust in which the participants can feel comfortable is important for the participants to give more genuine and realistic answers.

FINDINGS AND COMMENTS

Findings obtained within the scope of the research are presented in tabular form under separate themes. The opinions of the class teachers participating in the research on the situation between the leadership behaviors of the school administrators and the organizational commitment in the school are analyzed and the results are shown in Table 1.

Having an organizational commitment to schools will create a sense of belonging to employees. Employees work more self-sacrificing when they own their business. Selfless and loving work will contribute to the desired results. Undoubtedly, the leadership behaviors of the school administrators are very influential in ensuring organizational commitment in employees.

Table 1

Teachers' views of the situation between school leaders' leadership behaviors and organizational commitment in school.

Theme	N	%
School administrators are a good leader increases my loyalty.	29	%72.5
Making only his leadership of school administrators is not sufficient for positive results.	11	% 27.5
Total	40	%100

Teachers involved in the research **"Could you state your views on the situation between the leadership behaviors of the school administrators and the organizational commitment (feelings of belonging, emotional attachment, etc.) in the school?"** some of the answers they gave about the question are as follows:

(SA1). *"If the school manager is a good leader, the other teachers in the school will have more of them in their schools, and their sense of belonging will be higher".*

(SA15). *"Everything related to the school is assessed within the context of teacher student school administrators, so there is a commitment to school issues".*

(SA8). *"Since school administrators devote themselves entirely to this profession, their approach should be the same regardless of organizational and personal thinking".*

(SA35). *"If the manager is doing well and behaving fairly, the sense of belonging at school increases".*

When participant opinions are examined, it is seen that school administrators are paying attention to many features in order for organizational commitment to be formed in the schools. This fact points to the multidimensionality of management work and it is stated that organizational commitment can only be the result of many factors.

Opinions of school administrators about leadership behavior (justice, communication, body language, etc.) affecting your job satisfaction

The results of classroom teachers participating in the research and the opinions of the school administrators about the leadership behaviors affecting teachers' job satisfaction are analyzed and the results are shown in Table 2.

The adequacy of school leaders to have leadership behaviors and to make sure that teachers take the necessary precautions to increase job satisfaction will provide positive contributions at the point of ensuring job satisfaction. Some of the key features of school administrators' leadership behaviors are that school administrators are sensitive enough to be fair to teachers, that effective communication networks are established, and that body language is not affected negatively by the other side.

Table 2

Teachers' views of school administrators' leadership behavior affecting job satisfaction.

Theme	N	%
The fairness of the school administrators is a positive result.	26	%65
Watching school officials' unfair attitude will bring unrest and unhappiness.	14	%35
Total	40	%100

Teachers involved in the research “**Could you explain your views about the effects of school leadership's leadership behaviors (justice, communication, body language, etc.) to your job satisfaction**”? some of the answers they gave about the question are as follows:

(SA2). “*To be fair, the work will increase the spirit of accomplishment. Failure to be fair will cause the learned helplessness to break down*”.

(SA10). “*The fairness of school administrators affects teachers' performances positively. There are obvious deficiencies in communication. Success and communication are appreciated*”.

(SA11). “*The teacher's approach to the school administrator should be the language maker. This constructiveness affects your teaching positively. Unfortunately some administrators are not competent enough in this regard*”.

(SA13). “*I think that there are also shortcomings in specifying that you do not have a problem with this issue. There is a communication of respect among the school administrators teachers and employees. School administrators are meticulous in this regard*”.

(SA32). “*The words of the manager are the body language, the sweet language is important in terms of job satisfaction of the teacher*”.

(SA33). “*The better the body language and communication, the better the job satisfaction of the teacher*”.

When participant opinions are examined, it is seen that many characteristics of school administrators are attracted to school so that teachers' job satisfaction can be formed. This actually points to the multidimensionality of leadership.

Opinions about your expectations for establishing a healthy communication network between school managers and employees and ensuring the job satisfaction of employees

A healthy communication network between school administrators and employees can be achieved primarily through positive, non-discriminatory, democratic attitudes and behaviors of the manager. There is no problem among people working at a workplace or school where healthy communication possibilities exist. In case of any negative situation, it is also possible to establish a healthy communication and it will be easy to solve the problems.

Table 3 shows the results of analyzing the opinions of the class teachers attending the survey, the establishment of a healthy communication network between the school administrators and the employees, and the expectation for the job satisfaction of the employees.

Table 3

According to the teachers, the managerial features required for establishing healthy communication between school administrators and teachers and ensuring job satisfaction.

Teachers involved in the research **Could you explain your views about the establishment**

Theme	N	%
Communication	19	%47.5
Democratic	3	%7.5
Conscious relationship must be established	1	%2.5
Support for employees	3	%7.5
Be compatible	4	%10
Being egalitarian	1	%2.5
Well disciplined	1	%2.5
Fair	3	%7.5
Must Evaluate Employees' Achievements		
Ability to use body language	1	%2.5
Total		
	1	%2.5
	37	%92.5

of a healthy communication network between school administrators and employees and the expectation of job satisfaction for employees? some of the answers they gave about the question are as follows:

(SA18). *“To establish healthy communication, firstly it has a peaceful working environment. To have a peaceful environment, a good managerial communication must be felt first of all with strong fair rules”.*

(SA20). *“Everything must be borne by the teacher, with uncut failure or in the case where there is not enough success. Everyone has to put his hand under the stone. Everyone should succeed and fail. If necessary, the courses should be given support trainings, the poor students should not be accused of being a teacher because of poor readability”.*

(SA21). *“I have anticipations and opinions such as the fact that the administrators behave justly in the way that they behave fairly, that is, they should not be spoken at the same time”.*

(SA26). *“It is imperative that school administrators have the right to come. The dignitaries of the political administrators become incompetent with the school management staff”.*

(SA27). *“The more the school managers communicate with their staff, the more they feel that they value their views and opinions on fair and equal behaviour”.*

(SA39). *“Establishing a healthy communication between school administrators and employees can be achieved in a variety of ways. I think that situations such as the activities that employees can spend time together will contribute to the satisfaction of job satisfaction”.*

When participant opinions are examined, other aspects such as communication, discipline, harmony and democracy are emphasized besides the leadership skills that school administrators should have in order to establish healthy communication network and to provide job satisfaction of employees.

Feel loyalty to the institution you work with and opinions about the behavior of school administrators to increase your work efficiency:

School management is a multi-faceted concept. Both the increase of the employees' commitment to the institution and the increase of the work efficiency of the employees are responsible for the school administrators.

The results of classroom teachers participating in the study, their feelings of commitment to the institution you work with and their views on the behavior of school administrators in order to increase your work efficiency are analyzed and the results are shown in Table 4.

Table 4

According to teachers, the teachers' feelings of commitment to the institution and their views on the behaviors of school administrators to increase job satisfaction.

Theme	N	%
Empathy Established	1	%2.5
Equitable	2	%5
Fair	6	% 15
Respectful	1	%2.5
Arrogance	1	%2.5
Affiliated	1	%2.5
Communication is Strong	1	%2.5
Sincere	4	%10
Careful	1	%2.5
Clear	1	%2.5
Honest	2	%5
Indulgent	1	%2.5
Total	40	%100

Teachers involved in the research **What are your views on the behaviors of school administrators to increase your work efficiency and feel devotion to the institution you work with?** some of the answers they gave about the question are as follows:

(SA3). *“It is a fair, equitable, collaborative and democratic environment”.*

(SA4). *“There are also goodies, there are whims to satisfy the ego”.*

(SA5). *“Due to a lack of communication in the institution I work, there are disruptions in business discipline. Managers should perform their responsibilities more carefully”.*

(SA22). *“In order to increase the work efficiency of the employees, first of all, it is necessary to create respect and love between the employees and between the managers and the other employees”.*

(SA32). *“As a result of positive interaction between school administrators and employees, the sense of belonging develops. Thus, strangers will not suffer”.*

(SA34). *“The manager should take care to develop the sense of belonging to the employees of the institution they are in”.*

When participant views are carefully examined, it is seen that multi-directional leaders are more effective in increasing employee loyalty and job efficiency. Today's leaders need to be far from being stable, self-developed, open to innovation and broad horizons.

Opinions of school administrators about the effect of leadership behaviors on institutional values and commitment to goals

It is very important that the employees' assimilation of the corporate culture and values is in an attitude that depends on the targets set in accordance with the vision of the institution. Institutionalization in schools, like all businesses, creates an institutional set of values that is an important influence in making schools more effective. It is our country's pride that it is our school to achieve the goals that are appropriate for the institutionalization and vision of the schools and to carry out studies in line with these goals, to develop our education system and to gain a reputation accepted all over the world. In this regard, school administrators also have important tasks. Leadership behaviors are very important for school administrators to set goals for the school and to ensure that teachers work effectively to achieve these goals.

The opinions of the class teachers participating in the research on the situation related to the influence of the school administrators' leadership behaviors on institutional values and targets are analyzed and the results are shown in Table 5.

Table 5

Teachers' views of school principals' leadership behaviors about their ability to influence commitment to corporate values and goals.

Theme	N	%
Leader has an impact on corporate values.	28	%70
Leader is not effective in corporate values.		
Leader is Affective.	12	%30
Leadership is not effective in commitment.	22	%55
Total		
	18	%45
	40	%100

Teachers involved in the research **Could you explain your views of school leaders about the impact of leadership behaviors on corporate values and goals?** some of the answers they gave about the question are as follows:

(SA1). *“As long as a leading school administrator keeps the morale and motivation of the employees at the highest level and can use all the energy of the employees to achieve the corporate goals and values, it can not be a deviation from the corporate targets and values as long as they are the love and appreciation of all the employees with the behaviors of the leader school administrators”.*

(SA16). *“The school administrator is not a good leader but the teachers take him where he wants and I want him to be a manager and I think that he should have an oral exam for the leadership ability”.*

(SA17). *“No goal can be reached with an employer who is managing to taste the sense of leadership, which affects the commitment to these goals”.*

(SA18). *“Leadership behaviors are important in terms of applying them to corporate values, but what is important here is the communication used. In general, school managers are missing a few things because they use leadership qualities only to provide regulatory compliance. The rules should be stretched when necessary to ensure that employees are at peace”.*

(SA27). *“How progressive and good the leadership and managerial behaviors of the school administrators have positive influence on the employees, which increases the motivation of the employees and affects their employees positively”.*

When participant opinions are carefully examined, it is seen that multi-directional leaders are more effective in increasing employee loyalty and job efficiency. Today's leaders need to be far from being stable, self-developed, open to innovation and broad horizons.

In the data obtained about this aspect of the research, a large part of the participants pointed out that the leadership role of the school administrators in the sense of the organizational commitment of the teachers is important in the opinion of the school administrators about the effect of the leadership behaviors on the institutional values and the dependence on the targets, They gave very close answers as a percentage of whether they were effective.

RESULTS AND SUGGESTIONS

Findings obtained in the research were evaluated in terms of organizational commitment of teachers, leadership behaviors of school administrators, communication between school administrators and employees, employment of employees, commitment to institutional values and targets and the following results were obtained:

It has been determined that teachers are a good leader and the teachers will improve their loyalty to the school and feelings of belonging. It has also been observed that school administrators have a good management and justice, which will also contribute to the increase of organizational commitment. It has been determined that the way of expressing the body language, which is the communication method which is the result of the manager's leadership behaviors, is an important condition for the teachers' job satisfaction.

In addition to establishing a healthy communication network and ensuring the job satisfaction of the employees, school administrators have the necessary leadership skills as well as other aspects such as communication, discipline, harmony and democracy. Establishing strong communication between school administrators and teachers based on mutual trust ensures that both teachers' feelings of commitment to the institution and job satisfaction are increased.

Leadership behaviors directly affect teachers' job satisfaction at the point of reaching the institutional goals of school administrators, and those who are satisfied with their work are more productive in organizational structure. Teachers' perceptions of institutional loyalty and work efficiency will increase if school administrators behave fairly and sincerely in relation to teachers.

When school managers use their leadership qualities to just adhere to the rules and to ensure authority, they cause situations that affect negatively the job satisfaction such as uneasiness among employees, reluctance to go to work, poor performance.

Based on the research findings, the following suggestions were developed:

Providing the job satisfaction of the teachers constituting the basic building block of the training activities will increase the quality of the education and the yield to be achieved. For this reason, it can be said that it would be more appropriate to select from innovative teachers who have professional qualifications and experience, which are the leadership qualities of school administrators.

Many teachers state that school administrators do not have effective communication skills and leadership skills, and that they are experiencing some difficulties, which leads to reluctance, poor performance and inefficiency in going to work. As is known, in our current education system, school administrators are selected among the teachers. Relevant trainings may be provided in the form of seminars in or after the training faculties, in order to provide leadership and communication with the teachers.

The turning of the teaching profession into an increasingly disqualified and discredited profession has a negative impact on teachers psychologically. In order to gain the reputation of the teachers and the teaching profession, necessary measures should be taken through legal regulations as well as media, and the economic difficulties of the teachers can be removed and financial opportunities can be increased.

REFERENCES

- Aydın, M. (2010). *Eğitim Yönetimi* (9.baskı). Ankara: Hatiboğlu Yayınları.
- Barlı, Ö. (2005). İlköğretim Okul Öğretmenlerinin Motivasyonları: Farklılıkların ve Sorunların Araştırılması. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 5(1), 391-417.
- Can, N. (2013). *Öğretmen Liderliği*. Ankara: Pegem Yayınları.
- Çırpan, H. (2013). Öz'den Liderlik: İçsel Dönüşüm. *Sosyal Sorumluluk ve İnsani Değerler*. Şubat. 70-77.
- Ehtiyar, R. ve Tekin, Y. (2011). Başarının Temel Aktörleri: Vizyoner Liderler. *Yaşar Üniversitesi Dergisi*, 24(6), 4007-4023.
- Ekinci, A. ve Özdaş, F. (2011). Okul Müdürlerinin Yenilenen İlköğretim Programlarına Yönelik Öğretimsel Liderlik Davranışlarının Öğretmen ve Yönetici Görüşlerine Göre Değerlendirilmesi. *Çağdaş Eğitim Dergisi*, 36(382), 22.
- Eren, E. (2010). *Örgütsel Davranış ve Yönetim Psikolojisi*. İstanbul: Beta Yayıncılık.

- Ersoy, A. ve Yalçınmoğlu, P. (2014). *Nitel Araştırmaya Giriş*. Corrine Glesneden Çeviri (4. Baskı). Anı Yayıncılık.
- Gürsel, M. (2013). *Türk Eğitim Sistemi ve Okul Yönetimi*. Konya: Çizgi Kitabevi Yayınları.
- Kan, M.M. ve Parry, K.W. (2004). Identifying Paradox: A Grounded Theory of Leadership in Overcoming Resistance to Change. *The Leadership Quarterly*, 15, 467-491.
- Kantar, H. (2010). *İşletmede Motivasyon*. İstanbul: Kum Saati Yayınları.
- Özcan, Y. (2011). *İlköğretim Öğretmenlerinin İş Tatmini İle Yöneticileri İçin Algıladıkları Liderlik Davranışları Arasındaki İlişki Düzeyi* (Yayımlanmamış Yüksek Lisans Tezi). Yeditepe Üniversitesi, İstanbul.
- Özdemir, S., Sezgin, F. ve Kılıç, D.Ö. (2015). Okul Yöneticisi ve Öğretmen Görüşlerine Göre Okul Yöneticilerinin Liderlik Yeterlikleri. *Eğitim ve Bilim*, 40(177), 365-383.
- Süslü, R. (2015). *Ortaöğretim Okulları Yöneticilerinin Teknolojik Liderlik Yeterlilikleri* (Yayımlanmamış Yüksek Lisans Tezi). Zirve Üniversitesi, Gaziantep.
- Ünal, M. (2012). *21.YY'da Değişim, Yönetim ve Liderlik*. İstanbul: Beta Basım A.Ş.
- Varışlı, Y. (2010). *İnşaat Firmalarında Çalışanların İş Doyumu* (Yayımlanmamış Yüksek Lisans Tezi). Çukurova Üniversitesi, Adana.
- Yıldırım, A. ve Şimşek, H. (2008). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri* (6. Baskı). Ankara: Seçkin Yayıncılık.
- Yıldırım, A. ve Şimşek H. (2013). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri* (9. Baskı). Ankara: Seçkin Yayıncılık.
- Yücel, İ. ve Demirel, Y. (2013). Mevcut İş Alternatiflerinin İş Tatmini ve İşten Ayrılma İlişkisi Üzerine Etkisi: “Başka Bir Yol Daha Olmalı!”. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 27(2), 159-177.

The Relation Between Ethical Leadership and Organizational Justice in School Administration

Behcet ÖZNACAR

behcet.oznacar@neu.edu.tr

Near East University, North Cyprus

Hüseyin GÖLGE

huseyingolge@hotmail.com

ABSTRACT

People have gained the virtue of maturity to understand what is right for people and to live better. People accept socially accepted attitudes as behaviors that represent ethical leadership fairly and equally, by doing this they aim to act in accordance with social norms to comply with laws and regulations. With this reason a leadership, which is not accepted emotionally by the society and the subordinates, won't be accepted emotionally. In this case, it is very important that the managers of schools should also adopt the behavioral ethical leadership. The aim of the research is to investigate the relationship between behavioral ethics leadership and teacher's sense of organizational justice. For this reason, it has been tried to find out how much the teachers and administrators who work in schools can create organizational justice in terms of ethical leadership behaviors. In this study, which used to determine the relationship between the ethical leadership behavior of the school management and organizational justice, the relational screening model was used. As a result, it was determined that the teachers were more influenced by outsider behaviors in the sub - dimensions of managerial ethical leadership behaviors and sub - dimensions of organizational justice. Teachers have adopted the Behavioral Ethics dimension among the sub-dimensions of ethical leadership. They followed ethical communicative and climatic ethical behavior without deciding. The teachers gave the managers scores below the average in terms of organizational justice. When the school principals implement the procedural behaviors, an increase has been seen in their perceptions of adoption of climatic ethics and communicative ethical behavior patterns.

KeyWords: Ethical leadership, organizational justice.

INTRODUCTION

In the globalizing world, while the borders of countries disappear and all trade and cultural differences vanish, whereas human beings adopt the process of being individualized and different. Individuals have a tendency to express themselves individually and to keep the boundaries of freedom on the broadest scale. However, these individuals have to act within certain limits and rules in organizational structures. Namely, they are directed under the authority of an administrator. For this reason, the manager who completes the authority layer needs to play an important role in providing organizational justice among the variables in the organizational structure. The relationship between ethical leadership behaviors in providing organizational justice gains importance in this case.

According to Turhan (2009), when it is thought that organizations and leaders' employees are expected to exhibit ethical behavior, it is necessary for their leaders to show their behavior in the direction of expectations. Otherwise, they may create a risk in the sense that they will not rely on a real basis in the eyes of the employees and the employees may change their behavior in an ethical way that they will not be found sincere.

Ethical behavior also provides teachers with confidence in their managers. In an organization, the trust may rise or fall in line with justice sentiment.

The quality of the relationship between the manager and the employee is also related to the confidence that the employee has with the manager. The fact that the employees does not doubt their manager's behavior and words depends on the quality of the interaction between them. The high quality of the interaction between the employee and the manager also affects the trust that the employee feels about the manager (Köy, 2011).

According to Uysal (2002), organizational justice concerns the ways in which individuals are being treated fairly in organizations they are working with, and how justice affects work-related variables. Researchers believed that employees had a more positive attitude toward their jobs, job satisfaction and managers when treated fairly. Adams said that people would not only be unhappy when they meet with injustice, but will also tend to give a variety of reactions to it.

While employees expect a fair attitude from their managers in the organization, the performances of the managers and the quality of their ethical behavior seem to depend on each other. In real life, the unfavorable behavioral dimensions of this dependence may cause various problems from the point of view of the employees to the satisfaction of the job and the resignation of the worker.

The ease with which schools use the authority supported by the laws of their authorities is negatively reflected in the teaching. The teacher, who is a teacher who trains people as a profession with a high cognitive level, expects the virtuous behaviors taught by the teacher to his students. For this reason, it is a problem that school administrators cannot establish a justice system centering on ethical behavior. The purpose of this research is to examine the concept of ethical leadership and the ethical leadership views of teachers working in schools on the harmony between organizational justice and values as an individual and as a system. In this study, it is aimed to find out how much the teachers who worked in schools and ethical leader qualities can create organizational sense of justice in the institutions they are working with.

In terms of maintaining their assets and solving the problems they face, it is very crucial for organizations to ensure harmony between the goals and values of the employees and the target and values of the organization, to strive for the achievement of the goals by identifying with the organization, and to be willing to continue the membership of the organization (Vural ve Coşkun, 2007).

Organizational justice also has the dimension of developing affiliation with the institution being studied. According to Söyük (2007), Organizational commitment, which has positive results in terms of organizations, can be improved by creating organizational sense of justice in employees. For this reason, organizational justice has the potential to influence such positive behaviors through organizational commitment.

Every individual is an important element in social and organizational life, and the concept of justice is a social phenomenon. The most important sources of organizations are employees and influence attitudes and behaviors such as commitment, trust, performance, workforce and aggression. Finally, there is a shift towards a more educated workforce. As employees become more qualified and educated, they are not only demanding good jobs, but they also expect respect and sincerity at work (Yılmaz, 2004).

What matters most is how employees perceive management activities rather than whether they are injustice. The fact that perceptions are accurate and healthy depends on effective organizational communication, transparent and democratic management, and overall governance (Ardahan, 2010).

The aims of ethics as well as organizational justice are also important in this research. According to Yılmaz (2008); the purposes of the ethichs are as follows. (i) Entering into ethical idea-based forms and underlying processes that can develop human behavior (practice) in terms of ethical qualities, develop a critical, moral-determined consciousness. (ii) Showing that moral action is not an arbitrary action that one can or will wish to abandon if it does not want it, on the contrary, it is an indispensable attribute to human existence as a human being. Namely, teaching people to love.

This research is important because it is a study on both organizational justice and ethical leadership and it is the work of determining the relationship between them.

This research is conducted with the aim of examining the ethical leadership concept and the ethical leadership views of the teachers working in the schools on the alignment between organizational justice and values as an individual and as a system. Through research, it has been tried to determine how much the organizational sense of justice can be created by the teachers and ethical leadership qualities.

METHOD

Research Pattern and Model

In this research, which is trying to determine the relationship between ethical leadership behavior and organizational justice, the relational screening model is used. The relational screening model is a research model aiming to determine the presence or degree of exchange between two or more variables (Karasar, 2011).

Research Universe

The universe of the research consists of 2300 teachers who are working in 24 public schools in Batman province center in 2015-2016 academic year.

Research Sample

The sample of the study consisted of 579 teachers who were working in 11 schools in 2015-2016 academic year.

The demographics, frequency and percentage distributions of teachers participating in the research are also given in Table 1.

Table 1

Distribution of teachers by gender

Sex	N	Percentage
Male	346	60
Female	233	40
Total	579	100,0

According to Table 1, 60% (n = 346) of the teachers participated in the survey and 40% (n = 233) of the females.

Table 2

Distribution of teachers according to working time in schools

Study Time at Current School	N	Percentage
0-3 Year	295	51
4-6 Year	138	24
7-15Year	106	18
16 Year and more	40	7
Total	579	100

According to Table 2, 51% (n = 295) of the teachers participated in the study are between 0-3 years, 24% (n = 138) of them are between 4 and 6 years, 18% (n = 106) of them are between 7 and 15 years, 7% (n = 40) of them are in their current school for 16 years or more.

Data Collection Tools

Two scales were used for this research. The first of these scales aims to measure ethical leadership characteristics and consists of 44 items. The second scale, organizational justice scale, consists of 25 items.

The questionnaire consists of three parts. In the first part, there is a forum organized to determine the demographic information of the participants, in the second part the Ethical Leadership Scale and in the third part the Organizational Justice Scale.

The Ethical Leadership Scale (Yılmaz, 2005) was used to measure ethical leadership behaviors in school management. This scale consists of four sub-dimensions and 44 items.

The reliability coefficients calculated within the four sub-dimensions themselves; communicative ethics 0,95; climatic ethics 0,92; ethical decision-making was 0.94 and behavioral ethics subscale was 0.90 "(Yılmaz, 2005, aktaran, Konak, 2014).

Organizational justice scale; Measured by "Organizational Justice Scale" developed by Niehoff and Moorman (1996). The organizational justice scale developed by Niehoff and Moorman (1996) was adopted by Polat (2007) in Turkey.

First, a literature search was done. Scales related to the ethical leadership behaviors of school administrators and organizational justice were distributed to the schools forming the sample of the universe. Teachers were informed about volunteering and confidentiality by explaining how to apply the questionnaire.

Data Analysis

The SPSS program was used to calculate the data obtained in the study. For the analysis of the data, frequency distribution, arithmetic mean and standard deviation values were taken, pearson moment product correlation analysis was performed to determine the relationship between the ethical leadership behavior of the school administrators and organizational justice, t-test analysis, variance analysis (ANOVA) type statistics according to the surveyed data tables.

EVIDENCES

Findings and Comments on Teachers 'Opinions about School Administrators' Use of Ethical Leadership Behaviors

Table 3

The average of school administrators' scores on ethical leadership dimensions, standard deviation statistics

	N	Average	Sh.	ss
Behavioral Ethics	579	3,5442	,04190	1,00819
Communicative Ethics	579	2,0469	,01902	,45778
Climatic Ethics	579	2,1708	,01426	,34310
Decisional Ethics	579	3,0557	,03180	,76511
N	579			

According to the results of Table 3, it is seen that the teachers have adopted the Behavioral Ethics dimension among the sub-dimensions of the ethical leadership. Behavioral ethic dimension is 3,5; Communicative ethics 2; Climatic Ethics 2; Decisional Ethics has got 3 average points. Along with behavioral ethics, the greater adoption of the Decisional Ethical sub-dimensions by teachers may mean that teachers are more influenced by visible actions.

It can be said that the climatic ethical sub-dimension with the lowest score (,34310) according to the standard deviation scores has a more homogeneous distribution than the others.

Findings and interpretations of teacher perceptions about school administrators' level of application of organizational instrument

Table 4

Organizational Behavior of School Administrators According to Teacher Perceptions

	N	Mean	Std. Deviation
	Statistic	Statistic	Std. Error
Procedure Justice	579	1,8522	,00774
Interaction Justice	579	2,0748	,01415
Distribution Justice	579	2,0535	,01876
Valid N (listwise)	579		

According to the results of Table 4, it is seen that teachers receive scores below the average among the organizational justice sub-dimensions. Procedure Justice dimension 1,85; interaction justice 2; Distribution Justice got 2 average points. In all sub-dimensions of Organizational Justice, we can deduce the result that the teachers did not adopt school administrators. Nevertheless, when the average scores are taken into consideration, it is revealed that the school administrators can apply the Interaction Justice dimension at least as much as they can implement the Distribution Justice.

Table 5

Operational Justice Levels of School Administrators According to Teacher Perceptions

Operational Procedure Justice	N	Mean	Std. Deviation
Our decision-making system provides the right information to make decisions	579	1,4577	,51233
The existing decision-making system in our organization allows employees to question their decisions	579	1,9154	,62924
Our existing decision-making system ensures that everyone who is affected by the crisis is taken into account.	579	1,7737	,43498
Our institutional decision-making system has the necessary standards to ensure that decisions are taken consistently.	579	1,8964	,32694
The current decision-making system in our institution ensures that the views of all parties affected by the crisis are taken into account.	579	2,0294	,70894
Our institutional decision-making system ensures that problems related to the implementation of decisions and decisions are communicated regularly to employees	579	1,8204	,40181
Our existing decision-making system allows employees to request additional information and clarification about the decision.	579	2,0777	,41906
N	579		

In the end of procedural justice sub-questions, teachers gave scores below the average in order to demonstrate that they did not adopt school administrators. The lowest point in this issue is the question "Our decision-making system provides the right information to make decisions", which also refers to the beginning of operational process. Teachers find the institution's decision-making system to be wrong at first. It is seen that the answers to the next decisions are given under the middle of questioning, the ones who will be affected by the decision can be informed about this decision, the opinions are taken and shared and the answers about the system's transparency are given below average.

Table 1

School Administrators' Interaction Justice Implementation Levels According to Teacher Perceptions

Interaction Justice	N	Mean	Std. Deviation
Our manager considers our thoughts	579	2,0570	,75688
Our manager does not take sides	579	2,3040	,56191
Our manager is kind and understanding towards us	579	2,2781	1,00881
Our manager attaches importance to the rights of employees	512	2,2207	,43357
The admin gives feedback on how well the job has done	579	1,7219	,47467
My manager makes a real effort to be fair	579	2,2988	,47299
My manager supports me to overcome the challenges I face	579	1,9620	,53456
I can transfer my views on the award system to the manager	579	2,0829	,54554
I can share my business goals and plans with my manager	579	1,9188	,62140
The manager takes care to evaluate his performance in the most accurate and realistic way	579	1,7530	,44349
N	512		

In the Interaction Justice sub-dimension, teachers appear to have a common point with regard to not receiving feedback from the managers about the work they do most problematically (1.72) and as a standard deviation score (,4746). Teachers responded to other questions about interaction justice, but they also found that they had adopted low-level managers.

Table 2

School Administrators' Distribution Levels of Justice According to Teacher Perceptions

Distribution Justice	N	Mean	Std. Deviation
The responsibilities I take and the prizes I receive are compatible.	579	1,9223	,47698
The prizes I have with my experience are compatible with each other.	579	2,2383	,64587
I am being fairly rewarded according to the effort I have shown.	579	2,1710	,62540
I am rewarded when I do a good job.	579	2,1589	,81443
I am rewarded in the way I deserve according to my stress and tension.	579	2,0311	,61896
I consider myself fairly rewarded when I consider other employees with similar talents and training.	579	1,8446	,41597
I think I have been fairly rewarded when I consider other employees with similar talent and education.	579	2,2159	1,17501
I consider myself fairly rewarded when I consider employees who do the same work with me at other institutions.	579	2,0173	,74619
Valid N (listwise)	579		

When I look at the distribution justice options, most teachers show that they do not like school management in their answer to the question "I think I have been fairly rewarded when I consider other employees with similar talent and education." We can also conclude that this is the issue that teachers have the most to ally with the lowest standard deviation score for this problem. Another feature of this problem is that teachers respond by comparing themselves with other teachers. This is about the equality of distribution justice to the search for equality in the community. When the distribution justice of the administrators was taken into consideration, the teachers gave it to the other questions under the same heading.

Findings and interpretations of the relationship between school managers 'ethical leadership behaviors and teachers' perception of organizational justice

Table 3

Correlation Analysis of Relationships between School Administrators' Ethical Leadership Forms and Organizational Justice Levels According to Teachers

	Procedur e Justice	Interaction Justice	Distribution Justice	Climatic Ethics	Communicative Ethics	Behavioral Ethics	Decisional Ethics
Procedure Justice	1	,845**	,070	,251**	,313**	-,033	-,148**
		,000	,090	,000	,000	,433	,000
	579	579	579	579	579	579	579
Interaction Justice	,845**	1	,311**	,393**	,426**	-,044	-,205**
	,000		,000	,000	,000	,295	,000
	579	579	579	579	579	579	579
Distribution Justice	,070	,311**	1	,541**	,102*	-,035	-,133**
	,090	,000		,000	,014	,395	,001
	579	579	579	579	579	579	579
Climatic Ethics	,251**	,393**	,541**	1	,615**	,102*	-,050
	,000	,000	,000		,000	,014	,233

	579	579	579	579	579	579	579
Communicative Ethics	,313**	,426**	,102*	,615**	1	-,022	-,183**
	,000	,000	,014	,000		,595	,000
	579	579	579	579	579	579	579
Behavioral Ethics	-,033	-,044	-,035	,102*	-,022	1	,394**
	,433	,295	,395	,014	,595		,000
	579	579	579	579	579	579	579
Decisional Ethics	-,148**	-,205**	-,133**	-,050	-,183**	,394**	1
	,000	,000	,001	,233	,000	,000	
	579	579	579	579	579	579	579

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4

Regression Analysis between Distribution Justice and Ethics Leadership Lower Dimensions

INDEPENDENT VARIABLES	P	T	P
(Constant)		,982	8,491
			,000
Climatic Ethics		,948	19,370
			,000
Communicative Ethics		-,409	-10,008
			,000
Behavioral Ethics		-,031	-1,985
			,048
Decisional Ethics		-,083	-3,978
			,000
F	99,646**		
R	,640		
R²	,410		

** The value is significant at 0.01 level.

In Table 9, the relationship between distribution justice and sub-dimensions of ethical leadership was examined by regression analysis. In the regression analysis between interaction justice and the sub-dimensions of ethical leadership:

There is a significant correlation between positive and high level and 0.01 level between climatic dimension.

There is a significant negative correlation between communicative dimension and low level and 0,01 level.

There was no relationship between behavioral ethics.

There is a significant relationship between decision making and ethical dimension in negative, middle level and 0.01 level.

In the corresponding regression model R² was found to be 410. In other words, the ratio of the sub-dimensions of ethical leadership to the dimension of Behavioral Justice is 41%. The result is that distribution justice has more to do with ethical leadership, as this ratio is higher than interaction justice and procedural justice. F value is 99,646, indicating that the model is significant at p <0.01.

DISCUSSION

1. In terms of teachers 'views on the levels of school managers' use of ethical leadership behaviors;

Behavioral ethics dimension has become more of a consequence among teachers' sub-dimensions of ethical leadership.

Communicative and climatic ethical behaviors are seen as the same and last adopted behaviors, while the conclusion after behavioral ethics is the result of the ethical behavior adopted.

In the study titled "The Effect of Organizational Justice on Job Satisfaction and a Study on Nurses Working in Private Hospitals in Istanbul" by Söyük (2007) on the subject, it was seen that the lowest score was obtained by the distribution justice perception while the interaction justice took the highest score.

2. In terms of teacher perceptions of school administrators' levels of organizational justice;

Teachers were found to score below the average of organizational justice sub-dimensions. In all sub-dimensions of Organizational Justice, we can deduce the result that the teachers did not adopt school administrators. Nevertheless, when the average scores are taken into account, it is clear that the school administrators are able to apply the Interaction Justice dimension at the most, and they can put the Distribution Justice into practice at the lowest.

In the study of three sub-dimensions of organizational justice (Özdeveci (2003)), titled with "A Research on Determining the Impact of Perceived Organizational Justice on Individuals' Aggressive Behavior", in the first model, perceived organizational justice has been found to be effective in blocking behaviors and open aggressive behaviors. In the second model, it was found that the transaction model causes more aggressive behavior. In our study, the interaction justice sub-dimension was determined as the sub-dimension of organizational justice that teachers perceived most.

According to Irak (2004), "in a meta-analytic study of studies on organizational justice, have a high correlation with the satisfactions of the results obtained by individuals in their workplaces, job satisfaction, organizational attachment, trust, evaluation of authority and withdrawal behaviors. In a survey by Colquitt et al., It was found that interpersonal justice has a high correlation with the evaluation of authoritarianism; informative justice has been found to have a high correlation with both the evaluation of the management-oriented authority and the evaluation of the system. "

In terms of the meaningful relationship between teachers' views of school administrators on ethical leadership behaviors and organizational justice perceptions;

The result was that school principals increased their perceptions of adoption of climatic ethics and communicative ethical behaviors when they performed procedural justice behaviors, a decrease in the perception of adopting ethical behavior without decision. There was no increase or decrease in perceptions between procedural justice and behavioral ethical behavior.

In the regression analysis conducted between procedural ethics leadership and sub-dimensions of justice:

Positive, moderate meaningful relationship between climatic and communicative dimension,

Negative, weak level and meaningful relationship were found in decision making ethical dimension. It has been determined that there is no relationship between Behavioral Ethics and decision-making ethics.

For school principals, we have concluded that there is a decrease in the perception of adoption of climatic ethics and communicative ethical behaviors when their behaviors adopting interaction justice are realized, while the perception of ethical behavior is not a decision. There is no increase or decrease in perceptions between interaction justice and behavioral ethical behavior.

The relationship between interaction justice and the sub-dimensions of ethical leadership has also been examined by regression analysis. In this analysis:

Positive, low level meaningful relationship between climatic and communicative dimension,

There was a significant negative relationship between the decision and the ethics dimension. We have not found any significant relation between the decision decision and the behavioral decision.

The result was that school principals increased their perceptions of adopting climatic ethics and communicative ethical behaviors when their behaviors adopting distribution justice were carried out, while there was a decrease in the perception of adopting ethical behavior without decision. There was no increase or decrease in perception between distribution justice and behavioral ethical behavior.

The relationship between distribution justice and sub-dimensions of ethical leadership has also been examined by regression analysis. In this analysis;

Positive, low level meaningful relationship between climatic and communicative dimension,

There was a significant negative relationship between the decision and the ethics dimension. No relation with behavioral ethics has not been identified.

In a study by Arslantaş and Pekdemir (2007) entitled "A Sensitive Research on Determining Relations Between Transformational Leadership, Organizational Citizenship Behavior and Organizational Justice"; it has been found that the research style of research has a positive effect on organizational justice.

Pakdemir and Arslantaş (2007) found a meaningful relationship between managerial perceptions of organizational justice and transformational leadership behaviors of managers in their study of relationships between transformational leadership, organizational justice and organizational citizenship behavior. It is observed that the dimensions of mental stimulation and inspiration influence transformational leadership.

CONCLUSION

It has been found out that in the research conducted, the teachers are influenced by outsiders, observable behaviors in the sub dimensions of ethical leadership behaviors, or sub dimensions of organizational justice, and the perceptions of them are revealed accordingly. It is understood that these teachers are adopting the Behavioral Ethical Dimension. It is important why school administrators act within the framework of ethical rules in the following conditions:

1. In the subordinate and upper relationships in the school
2. The school's teaching process is reflected in the decision-making process
3. Teachers' relationships among themselves

Teachers have adopted the Behavioral Ethics dimension among the sub-dimensions of ethical leadership. Teachers have followed ethical communicative and climatic ethical behaviors in the same place and in the last place.

These findings show that teachers are sensitive to school administrators' decisions and that these decisions are evaluated in communication channels. School decisions have shown that the decisions made in the research, even if they seem to be related to school administrators' ethical behavior, are also influential on school climate and communicative ethics.

Teachers gave the managers scores below the average in all sub-dimensions of organizational justice. School principals are increasingly perceived as embracing climatic ethics and communicative ethical behavior when they adopt procedural justice behaviors. At the same time, the conclusion was that there was a decrease in the perception of adopting ethical behavior in decision-making.

The activities carried out in the school affect teachers' primary perceptions of organizational justice. Compliance with the ethical behaviors demonstrated during the implementation of these activities also positively increases climatic ethics and communicative ethics perceptions.

REFERENCES

- Akdoğan, A. ve Demirtaş Ö. (2014). *Etik Liderlik Davranışlarının Etik İklim Üzerindeki Etkisi: Örgütsel Politik Algılamaların Aracı Rolü*. AKÜ, İİBF Dergisi, 1 (6), 107-123.
- Altıntaş, Ç. (2006). "Bireysel Değerlerin Örgütsel Adalet ve Sonuçları İlişkisinde Önlendirici Etkisi: Akademik Personel Üzerinde Bir Analiz", Dokuz Eylül Üniversitesi, İzmir.
- Ardahan, F. (2010). *Hizmet Üretiminde Serbest Muhasebeci ve Mali Müşavirlerin Mesleki Problemleri, Mesleki Algılama Biçimleri ve İş Tatmin Düzeyleri. Sosyal ve Ekonomik Araştırmalar Dergisi*, 13(19), 101-139.

- Atalay, D.D. (2007). *Denklik Duyarlılığı Açısından Algılanan Örgütsel Adalet - Örgütsel Bağlanma İlişkisi*. (Unpublished PhD Thesis). Ankara Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.
- Atalay, İ. (2005). *Örgütsel Vatandaşlık ve Örgütsel Adalet*. (Unpublished Master Thesis). Afyon Kocatepe Üniversitesi Sosyal Bilimler Enstitüsü İlköğretim Sınıf Öğretmenliği Ana Bilim Dalı, Afyon.
- Aydın, İ. (2010) *Yönetişel Mesleki ve Örgütsel Etik*. Ankara: Pegem Yayınları
- Ayktut, S. (2007). *Örgütsel Adalet, Birey - Örgüt Uyumu ile Çalışanların İşle İlgili Tutumları*. (Unpublished Master Thesis). Yeditepe Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.
- Çağ, A. (2011). *Algılanan Örgütsel Adaletin, Örgütselsinizme ve İşten Ayrılma Niyetine Etkisinin Belirlenmesine Yönelik Bir Araştırma*. (Unpublished Master Thesis). Afyon Kocatepe Üniversitesi Sosyal Bilimler Enstitüsü İşletme Ana Bilim Dalı, Afyon.
- Çakır, Ö. (2006). *Ücret Adaletinin İş Davranışları Üzerindeki Etkileri*. Başbakanlık Basımevi.
- Çakır, Ö. (2001). *İşe Bağlılık Olgusu ve Etkileyen Faktörler*. Seçkin Yayıncılık.
- Çakmak, K. (2005). *Performans Değerlendirme Sistemlerinde Örgütsel Adalet Algısı ve Bir Örnek Olaya Çalışması*. (Unpublished Master Thesis). İstanbul Üniversitesi SBE, İstanbul.
- Çelik, V. (2007). *Eğitimsel Liderlik*, (4. baskı). PegemA Yayıncılık.
- Çolak, M., Erdost, H. E. (2004). Organizational Justice: A Review of The Literature and Some Suggestions For Future Research”, *Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 22(2), 51-84.
- Dedeoğlu, Gözde. (2004). “*Etik Düşünce ve Postmodernizm*”, Telos Yayıncılık, İstanbul.
- Dilek, H. (2005). *Liderlik Tarzlarının ve Adalet Algısının; Örgütsel Bağlılık, İş Tatmini ve Örgütsel Vatandaşlık Davranışı Üzerine Etkilerine Yönelik Bir Araştırma*. (Unpublished PhD Thesis). Gebze Yüksek Teknoloji Enstitüsü Sosyal Bilimler Enstitüsü, İstanbul.
- Doğan, A. (2008). *İlköğretim Kuramlarında Örgütsel Adaletin Örgütsel Bağlılık Üzerine Etkisi*. (Unpublished Master Thesis). Fırat Üniversitesi Sosyal Bilimler Enstitüsü Eğitim Bilimleri Anabilim Dalı, Elazığ.
- Durukan, H. (2006). Okul Yöneticisinin Vizyoner Liderlik Rolü. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, 7, 277-286.
- Esener, T. (2002). *Hukuk Başlangıcı: Genel Hukuk Bilgisi*. Alkım Yayınevi.
- Eraslan, L. (2003). *İlköğretim Okulu Müdürlerinin Dönüşümcü Liderlik Özellikleri*. (Unpublished Master Thesis). Kırıkkale Üniversitesi, Sosyal Bilimler Enstitüsü, Kırıkkale.
- Karaeminoğulları, A. (2006). *Öğretim Elemanlarının Örgütsel Adalet Algıları ile Sergiledikleri Üretkenliğe Aykırı Davranışlar Arasındaki İlişki ve Bir Araştırma*. (Unpublished Master Thesis). İstanbul Üniversitesi SBE, İstanbul.
- Karaman, P. (2009). *Örgütsel Adalet Algısı ile Tükenmişlik Arasındaki İlişkinin İncelemesine Yönelik Öğretmenler Üzerine Bir Uygulama*. (Unpublished Master Thesis). Yıldız Teknik Üniversitesi Sosyal Bilimler İşletme Anabilim Dalı, İstanbul.
- Kazancı, N. (2010). *İlköğretim okullarındaki yöneticilerin liderlik stilleri ile öğretmenlerin örgütsel adalet algıları arasındaki ilişki düzeyi*. (Unpublished Master Thesis). Sakarya Üniversitesi Sosyal Bilimler Enstitüsü, Sakarya.
- Kentsu, J. (2007) *Okul Yöneticilerinin Kişilik Özelliklerinin Örgütsel Etik Üzerine Etkisi*. (Unpublished Master Thesis). Yeditepe Üniversitesi, Sosyal Bilimler Enstitüsü, İstanbul
- Koçel, T. (2005). *İşletme Yöneticiliği*. Arıkan Basım Yayım Dağıtım Ltd. Sti.
- Köy, A. (2011). *Yöneticiye Güvenin İş Tatmini Üzerindeki Etkisinde Lider-Üye Etkileşiminin Aracı Rolü: İstanbul Ve Kocaeli İllerinde Beyaz Yakalılar Üzerinde Bir Araştırma*. (Unpublished Master Thesis). Marmara Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.
- Laçinoğlu, Z. (2010). *İlköğretim Okulu Öğretmenlerinin Örgütsel Adalet Algıları ile Bazı Örgütsel Davranışlar Arasındaki İlişki*. (Unpublished Master Thesis). Sakarya Üniversitesi Sosyal Bilimler Enstitüsü Eğitim Bilimleri Anabilim Dalı, Sakarya.
- Leblebici, D. (2008). "21. Yüzyılın Liderlik Anlayışına Bakış", Cumhuriyet Üniversitesi, Sivas.
- Nam, D. (2008). *Güven ve Örgütsel Adaletin Beklenti Ötesi Özyeterlilik Davranışına Etkisi*, Arma

- Filtre San. Ve tic. A.ş. Örneği.*(Unpublished Master Thesis). Sakarya Üniversitesi Sosyal Bilimler Enstitüsü Çalışma Ekonomisi ve Endüstri İlişkileri Ana Bilim Dalı, Sakarya.
- Polat, S. (2007). *Ortaöğretim öğretmenlerinin örgütsel adalet algıları, örgütsel güven düzeyleri ile örgütsel vatandaşlık davranışları arasındaki ilişki* (Unpublished PhD Thesis). Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü.(The Relationship between Organizational Justice Perceptions, Level of School and Administrator Trust, and Organizational Citizenship Behaviors of Secondary School Teachers in Turkey ERİC:ED507710)
- Polat, Soner ve Celep, Cevat (2008). "*Ortaöğretim Öğretmenlerinin Örgütsel Adalet, Örgütsel Güven, Örgütsel Vatandaşlık Davranışlarına İlişkin Algıları*", *Kuram ve Uygulamada Eğitim Yönetimi Dergisi*, 54 bahar, 307-331.
- Polat, Soner ve Celep, Cevat (2008). "*Relation Between Justice Perception And Perception Of Confidence In School Of Secondary School Vice-Directors*", 11. International Conference On Further Education In The Balkan Countries , (2008) Konya.
- Polat, Soner (2009)."*Organizational citizenship behavior (OCB) display levels of the teachers at secondary schools according to the perceptions of the school administrators*", *Procedia - Social and Behavioral Sciences, Volume 1, Issue 1, 2009*, Pages 1591-1596 elsevier doi:10.1016/j.sbspro.2009.01.280
- Özden, Y. (1999). *Eğitimde Dönüşüm, Eğitimde Yeni Değerler ve Oluşum*. 2. Baskı. Pegem A Yayıncılık.
- Özmen, Ö. ve ark. (2007). Adalet Verilen Değerin Adalet Algıları Üzerindeki Etkisinin Sorgulanmasına İlişkin Bir Araştırma, *Ege Akademik Bakış*, 7(1),17-33.
- Şimşek, M. Şerif, Akgemici, T. ve Çelik, A. (2003). *Davranış Bilimlerine Giriş ve Örgütlerde Davranış*. Yaşar Ofset.
- Sabuncuoğlu, Z. (2005). *İnsan Kaynakları Yönetimi*. Alfa Aktüel Basım Yayın.
- Sankurt, B. (2015). Etik liderlik Davranışının Çalışanların İş Tatminini Arttırma Yönlündeki Etkisi ve Call Center Uygulaması. (Unpublished Master Thesis). Bahçeşehir Üniversitesi. Sosyal Bilimler Enstitüsü, İstanbul.
- Sayın, U. (2009). Güven: İşletmelerde Algılanan Örgütsel Adalet ve İş Tatmini Arasındaki İlişkide Bir Aracı - Bir Uygulama.(Unpublished Master Thesis). Atatürk Üniversitesi Sosyal ilimler Enstitüsü İşletme Anabilim Dalı, Erzurum.
- Soydan, S. (2011). *Çalışanların İş Tatmini ile Örgütsel Adalet Algısı Arasındaki İlişkiye Yönelik Temizlik Ürünleri Sektöründe Bir Araştırma.*(Unpublished Master Thesis). Yıldız Teknik Üniversitesi Sosyal Bilimler Enstitüsü İşletme Ana Bilim Dalı, İstanbul.
- Söyük, S. (2007). *Örgütsel Adaletin İş Tatmini Üzerine Etkisi ve İstanbul İlindeki Özel Hastanelerde Çalışan Hemşerilere İlişkin Bir Araştırma.*(Unpublished PhD Thesis). İstanbul Üniversitesi Sosyal Bilimler Enstitüsü İşletme Yönetimi ve Organizasyon Bilim Dalı, İstanbul.
- Teyfur M., Beytekin,O ve Yalçınkaya, M. (2013). İlköğretim Okul Yöneticilerinin Etik Liderlik Özellikleri ile Okullardaki Örgütsel Güven Düzeyinin İncelenmesi İzmir İl Örneği. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, 21, 84-106.
- Temgillioğlu, D. (2005). Hizmet İşletmelerinde Liderlik Davranışları ile İş Doyumu Arasındaki İlişkinin Belirlenmesine Yönelik Bir Araştırma, *G.Ü. Ticaret ve Turizm Eğitim Fakültesi Dergisi*, 2005/ No:1.
- Titrek, O. (2009). *Öğretmenlerinin Örgütsel Vatandaşlık Davranışlarına İlişkin Görüşleri*, *Akademik Bakış*, 17, 1-28.
- Turhan, M. (2009). *Genel ve Mesleki Lise Yöneticilerinin Etik Liderlik Davranışlarının Okullardaki Sosyal Adalet Üzerindeki Etkisi*. (Unpublished PhD Thesis). Elazığ: F.Ü. EBA, Elazığ
- Tutar, Y. (2007). *Erzurum'da Devlet Ve Özel Hastanelerde Çalışan Sağlık Personelinin İşlem Adaleti, İş Tatmini ve Duygusal Bağlılık Durumlarının İncelenmesi*, Süleyman Demirel Üniversitesi *İİBF Dergisi*, 12 (3), 97- 1 2 0 .
- Uğurlu, T. C. (2009). *İlköğretim Okulu Öğretmenlerinin Örgütsel Bağlılık Düzeylerine Yöneticilerinin Etik Liderlik ve Örgütsel Adalet Davranışlarının Etkisi.*(Unpublished PhD Thesis). İnönü

- Üniversitesi Sosyal Bilimler Enstitüsü Eğitim Bilimleri Anabilim Dalı Eğitim Yönetimi ve Denetimi Bilim Dalı, Malatya.
- Uysal, D. (2002). *Örgütlerde Kişilerarası Adil Davranış Algısı ile İletişim Tarzı Arasındaki İlişki*. (Unpublished Master Thesis) Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.
- Vural, Z. ve Coşkun, G. (2007). *Örgüt Kültürü: İletişim, Liderlik, Motivasyon, Bağlılık ve Performans Açısından Değerlendirme*. Ankara: Nobel Yayınları.
- Yılmaz, E. (2005). *Okullarda Örgütsel Güven Ölçeğinin Geçerlik ve Güvenirlilik Çalışması*. *Selçuk Üniversitesi Sosyal Bilimler Dergisi*, 14, 567–580.
- Yılmaz, E. (2006) *Okullardaki Örgütsel Güven Düzeyinin Okul Yöneticilerinin Etik Liderlik Özellikleri ve Bazı Değişkenler Açısından İncelenmesi*. (Unpublished PhD Thesis). Selçuk Üniversitesi, Konya.
- Yılmaz, K. (2008). *Eğitim Yönetiminde Değerler*. Ankara: Pegem Yayıncılık.
- Yılmaz, G. (2004). *İnsan Kaynakları Uygulamalarına İlişkin Örgütsel Adalet Algısının Çalışanların Tutum ve Davranışları Üzerindeki Etkisi*. (Unpublished PhD Thesis). İstanbul Üniversitesi SBE, İstanbul.
- Yolaç, S. (2009). “*Politik Davranış ve Örgütsel Adalet Algısı Arasındaki İlişkinin Belirlenmesine Yönelik Bir Araştırma*”, *Marmara Üniversitesi Sosyal Bilimler Enstitüsü, Öneri Dergisi*, 8 (31),157-166
- Yolaç, S. (2011). “*Yöneticinin Algılanan Liderlik Tarzı ile Yöneticiye Duyulan Güven Arasındaki İlişkide Lider-Üye Etkileşiminin Rolü*”, *Marmara Üniversitesi. İstanbul*.

Evaluation of School Executives' and Teachers' Views Related to School Executives Exhibition Leadership Behaviors

Behcet ÖZNACAR

behcet.oznacar@neu.edu.tr

Near East University, North Cyprus

Şerife PARLAKTEPE GAZİLER

halilsherife@hotmail.com

ABSTRACT

The aim of the research was to evaluate the views of school executives and teachers on the demonstration of the teaching leadership behaviours of school executives in the Turkish Republic of Northern Cyprus. The case study was used in the research qualitative research design. Participants consisted of 10 school executives and 10 teachers who were selected by snowball sampling method among the teachers working in primary schools affiliated to TRNC Ministry of National Education in 2016-2017 school year. Participants were asked open-ended and semi-structured questions and interview techniques were applied. Voice recording was received during the call. The obtained data were analysed by qualitative data analysis method. Findings analyzed using content analysis and thematic analysis methods were presented and interpreted. When the answers given by the school executives and the teachers to the interview questions are examined, It has been seen that the school executives have determined the school objectives in terms of determining and sharing the goals of the school. It has been determined that school executives do not have enough knowledge about educational programs in terms of managing the education program. On the assessment of pupils, school executives have reached the conclusion that pupils have supported pupils in increasing pupils' achievement. It has been observed that school executives have contributed to the professional development of teachers as a support of teachers. On the level of establishing a regular learning environment, managers have been cooperating with the social environment and achieved the motivation that motivates teachers to increase motivation. It has also been observed that school executives have demonstrated effective management in school management.

Key Words: School, Director, Teacher, Education, Leadership.

INTRODUCTION

Education has a major place in every aspect of life. There is a need for leaders and leading persons in organizations for education to be good. Such leaders should have some characteristics so as to be able to lead the way. These characteristics are to educate people who know the school objectives, support the teachers within the institution, educate people who form the environment to contribute to learning process in a positive way, contribute to the development of the social environment and finally influence people positively (Bozkurt, 2013). There is always a leader who directs the organization in every institution. The fact that leaders are qualified persons will increase the quality of educational institutions too.

School is a social institution where personality of individuals takes shape first. Schools are the places where certain goals are achieved. The task of the schools is to perform such objectives at best (Şişman, 2011). Today school executives should be the persons who renew and change the information appropriate to changing and developing conditions. Teachers and directors who are the workers of school should have influential leadership characteristics so as to name an organization (Erdem & Uçar, 2013). Effective school researches put forward that school executives also should be effective teaching leaders (Bozkurt, 2013). The school executives should gain the knowledge, ability and attitudes that are necessary in teaching environment (Helvacı & Aydoğan, 2011).

The balance of power changes in favor of teachers, students and families in school executive profile predicted by teaching leadership approach. A trend towards management and teaching approaches where power sharing exists among teachers, students and families is seen (Leithwood, 1992). The Ministry of Education decided to make a number of changes. Instead of an old and traditional educational approach, a contemporary educational approach which lets train individuals producing knowledge is selected.

There is need for school executives who hold teaching leaders appropriate to the needs of the age in order to achieve the goal in contemporary education approach (Özdemir & Sezgin, 2002). Gümüşeli (1996), Şişman (2002a), Akgündüz (2004) conducted studies in relation to what extent school executives execute their duties on teaching leadership. According to Öztürk (2005), teaching leadership is in interaction with occupational exhaustion of organization's workers. According to Can (2007), administrators as a good leader each, conducted studies allowing educational programs to reach their goals.

Hallinger and Murphy conducted researches about teaching leadership. Considering these studies (1986), information about the administrators' task on teaching leadership was reached. Smith and Andrews (1989) conducted studies to determine educational leadership behaviors of school executives based on the perception of teachers and students. Krug (1992) conducted researches in the direction of student climate and student success through teaching leadership behaviors that directors show. Blase and Blase (1999) conducted studies regarding how teaching leadership behaviors of school executives influence teaching process within classroom. Edmonds, Rutter, Brookover and Lezotte also conducted studies on teaching leadership. It was observed as a result of these researches that it is possible to create effective school environments through a good teaching leadership (Hallinger & Murphy, 1986). As it could be understood from these definitions made, teaching leadership is stated to be leadership field which is leading educational program, student-teacher activities and educational processes (Gümüşeli, 2001).

Teaching leadership is directly linked to learning and teaching activities. For this reason, it will increase the quality of both educational institutions and learning and teaching activities in these institutions that leaders show effectively teaching leadership behaviors; thus, it will become possible to train conscious individuals who comply with the requirements of modern age, can solve problems, put into practice those information they learn about. It can be observed that there is decrease in students' success in educational institutions. There are difficulties in performing the goals of schools. The information learned cannot be enough in solving problems, school executives cannot use the schools sources and school staff, and problems are faced in schools. Educational leadership of school executives is quite important in order to increase students' success, to realize the goals of schools, to make use of school resources efficiently and to find solution for the problems faced in schools. Taking a look into the literature, it can be seen that many studies were conducted in educational leadership field in developed countries. But, this subject is newly focused in Turkey. There is not much research on this subject in our country.

METHOD

Model of the Research

As school executives' and teachers' views on school executives' exhibition leadership behaviors are researched in this study, the qualitative research method was used. Qualitative research is a research where data is collected through data collection tools like interview, observation, document analysis by investigating profoundly the cases in natural environment (Yıldırım & Şimşek, 2008). The research was designed with qualitative case study. Case study means to investigate the factors about a realized case profoundly and as a whole, and how they affect it or they are affected by it (Yıldırım & Şimşek, 2011).

The Universe and Sample / Research Group

Study group of the research consists of administrators and teachers working in primary schools, affiliated to the Ministry of Education of Turkish Republic of Northern Cyprus in 2016-2017 academic year. 10 administrators and 10 teachers who were selected by snowball method within the indicated study group form the sample of the research.

It is called snowball sampling to the participating group which is formed by reaching a person who may contribute to the research and then reaching another upon recommendation of the other person and reaching another upon the recommendation of this secondary one (Yazıcıoğlu & Erdoğan, 2004). According to Yıldırım and Şimşek (2011), the answers which can bring solution to the problem can be reached by virtue of chain or snowball sampling method. Moreover, it is one of the most effective methods from which we can provide profound information.

Data Collection Tool and/or Technics

The data was collected through semi-structured interview form in this research. (ANNEX 2). The interview form where questions to be asked in this technique are prepared in advance. The questions were prepared at the end of literature review investigation. First of all, 10 open-ended questions were prepared. The researcher can do a more detailed research by adding new sub-questions when he/she sees it to be necessary (Türnüklü, 2000).

Data Analysis

The views of participants were collected regarding the questions of the interview form in this research, and analysis was made through content analysis. A document of interviews is created by giving a number to each of the participants here. An investigation is carried out within the scope of the study and data obtained, separated into parts, they were named and coded in the way that every section is stated conceptually. By taking into consideration the research questions and conceptual frame, the final shape emerged after the data which was obtained in code list was investigated. This list served as key point while arranging data and themes emerged after the separation of codes into different categories. The data presented in details in this section were interpreted by the researcher and so the results were obtained. After the data obtained was strained in the filter that qualitative research process required, it was interpreted and the results were obtained.

Validity and Reliability of the Research

The duration of interviews made with teachers and administrators was extended and the persuasiveness was increased. This persuasiveness was tried to be increased by the control of data consistency. Reliable information was tried to be obtained by controlling the conceptual frame to be consistent with findings. The persuasiveness was increased by virtue of direct quotes made from administrators and teachers interviewed. The researchers and a lecturer having experience in qualitative research study made calculations to increase internal reliability of the research by coding and comparing them to see whether they were consistent or not. Participants of the research touched upon the details about research environment in order to increase external reliability of the research. In addition, in case that a research is conducted in future, raw data are kept for allowing comparison between the two. The formula of Miles and Huberman (1994) was used for reliability of the research, and it was calculated as 89% approximately. That the reliability calculations are observed to be over 70%, the research is considered to be reliable. Themes were created by virtue of the matching codes in coding phase (Özberk, 2015).

Findings

Table 1: Views of the school regarding the goals:

Themes	School Executives			Teachers		
	Indicating	Total	Percentage	Indicating	Total	Percentage
School objectives to train people as good individuals	6	10	60	5	10	50
School objectives to bring students profession	5	10	50	4	10	40
School objectives to socialize students	7	10	70	4	10	40

According to Table 1, 70% of participating school executives and 40% of teachers stated their views that school objectives socialize students. It can be concluded from the socializing fact of school objectives for students is that students can bring up social environmentally compatible individuals.

Table 2: Qualifications of teachers in teaching a lesson within classroom:

Themes	School Executive			Teacher		
	Indicating	Total	Percentage	Indicating	Total	Percentage
Insufficiency of school resources	4	10	40	3	10	30
Insufficiency of teachers' communication skills	5	10	50	5	10	50

According to Table 2, 60% of participating school executives and 40% of teachers reflected that school resources are insufficient. Teachers and administrators who think that lack of infrastructure causes teachers not to execute their profession as it should be believe that the ministry that is responsible for education does not provide the schools with sufficient sources. Teachers agree that school principal should provide the necessary resource at all costs.

Table 3: Follow-up of students' success:

Themes	School Executive			Teacher		
	Indicating	Total	Percentage	Indicating	Total	Percentage
Teachers' observation outside classroom	9	10	90	7	10	70
Evaluation of students' studies	9	10	90	7	10	70

According to Table 3, 90% of participating school executives and 70% of teachers stated that student studies should be evaluated. It was concluded from such views that the evaluation of students' studies is cared by both school administrators and school executives; and the objective is to increase the success. As a result of this research, it can be thought that educational leadership affects students' success in a positive way.

Table 4: Views on what are done for supporting teachers:

Themes	School Executive			Teacher		
	Indicating	Total	Percentage	Indicating	Total	Percentage
Providing financial support	7	10	70	6	10	60
Providing moral support to teachers	6	10	60	5	10	50

According to Table 4, 70% of participating school executives and 60% of teachers stated their opinion in favour of teachers to provide them moral support. It was inferred from this point that school executives support teachers and encourage them is a pleasing situation for these related teachers. The participating teachers clearly pointed out that moral support is also important and necessary as well as financial support. Instructional leaders support teachers with regard to carrying out their duties better and think that it is necessary to encourage them for improving themselves.

Table 5: Views of teachers about occupational development:

Themes	School Executive			Teacher		
	Indicating	Total	Percentage	Indicating	Total	Percentage
Usage of classical methods by school teachers						
State of school teachers to be innovative	1	10	20	4	10	40
Having knowledge about educational programs	2	10	20	2	10	20
In-service training course needs of school teachers	3	10	30	7	10	70

According to Table 5, 40% of participating school executives and 10% of teachers stated that teachers use classical methods. It can be said that teachers are bound to classical methods within the framework that teachers use classical methods, they do not follow up new methods and they close themselves to innovations, so they face problems in terms of professional development.

Table 6: Views on what is done for providing the team spirit within school staff:

Themes	School Executive			Teacher		
	Indicating	Total	Percentage	Indicating	Total	Percentage
Including the sportive activities	3	10	30	4	10	40
Creating synergy in school environment	5	10	50	3	10	30
The presence of school trips	7	10	70	6	10	60

According to Table 6, 70% of both participating school executives and teachers stated that sportive activities are necessary to create team spirit at school. It is accepted that it will create a positive learning and teaching environment at school to create synergy by organizing common activities in school environment and spending time together. We can reckon that teachers and administrators who possess the team spirit work more efficiently and happily. It was observed that a great number of school executives and teachers were volunteer for organizing sportive activities and participating them in order to create team spirit. We may think that it could be possible to have fun and spend time together thanks to common activities, and this will reflect into education within the institution positively.

Table 7: Views about what is done to improve the cooperation of environment and school:

Themes	School Executive			Teacher		
	Indicating	Total	Percent	Indicating	Total	Percent
Making parent-teacher association meetings						
Making visits as school executives and organizations and individuals	5	10	50	2	10	20
Access of school and teachers to data via telephone and SMS	8	10	80	9	10	90
Visiting parents as school	4	10	40	4	10	40
Providing financial support from parents as school	7	10	70	3	10	30

According to Table 7, 80% of participating school executives and teachers for environment and school association stated their views in the direction that there should be parent-teacher association meetings.

It was concluded from this research that parent-teacher association is minded to develop school and environment cooperation. We can say that teaching leadership is related to teaching and learning activities, and improving environmental communication with organizations is necessary to increase the quality of these activities.

DISCUSSION

5.1. Views about the School Objectives

We can conclude that the schools have major tasks in solving the problems experienced in the environment from the view that school objectives train people as good individuals. It was observed that school executives were aware of school objectives. It was inferred from the view that the school objectives are to bring up generations who are beneficial for the society, complying with environmental conditions and leading the future, and to bring them profession. It can be concluded from the view that school objectives socialize students the school objectives are that students bring up individuals complying with the social environment. It was observed that activities aiming at training social individuals at schools are carried out. It can be concluded from the view that school objectives bring up problem solving individuals the success in education will increase when individuals who can solve problems are brought up. It was observed that there are problems in bringing up problem solving individuals. We can say that the role of teaching leadership of the administrators in schools is very important in terms of training individuals who can comply with the improving and changing environmental conditions and deal with the emerging problems.

It was concluded from this research that educational leadership behaviours are influenced by problem solving and decision making behaviours. Arın (2006) investigated in his research the problem solving connection of school executives through educational leadership. It was inferred that the administrators make their own decisions without caring about other views influences negatively their educational leadership behaviours.

5.2. Views about the Qualification of Teachers in Managing Interclass Courses:

Most of the participants comply about the insufficiency of school resources. The administrators and teachers who think that the lack of infrastructure causes teachers not to perform their duties as required believe that the ministry of education does not supply the schools with sufficient resources. It is believed that educational leadership activities in schools where there is deficiency of resource will be influenced negatively. We can conclude from the view against teachers to have lack of communicational skills that there are some problems with teachers in communicating with their students and in lowering themselves to students' level. If we should consider that communicational skills should be good to manage educational leadership, it can be said for educators that they should improve themselves. Educational leaders should; be the leaders of school success, bring the quality of education to the forefront, provide the resources that teachers need, participate in learning and teaching activities at schools instead of only observing, and finally establish efficient communication within school (Özdemir & Sezgin, 2002). Educational leaders should encourage teachers to fulfill their tasks and provide opportunities so as to improve themselves as well (Aksoy, 2006). It was concluded from the view of half of participating teachers and administrators on the insufficiency of classroom management abilities that teachers face problems especially in managing crowded classrooms and they cannot administer class discipline. It can be said that there is more need for educational leadership in these schools as they require better management skills.

It was concluded from this research that educational leadership is influenced by lack of communication. Gürsun (2007) concluded from his study that educational leadership behaviours are influenced negatively in cases where there is non-communication, making own decision and ignoring emotions and thoughts.

5.3. Views about Success of Students

We can conclude from the thought of most of the participants against inside and outside class observation of students that follow up of students is necessary for making school reach its goals successfully and training qualified individuals, and leaders should monitor student success by making observations in order to perform their leadership duties. We can suppose that school executives and teachers have major role in providing students with quality education, and observing students may influence student success in a positive way. As the view for evaluating the studies of students is mentioned by nearly all of both teachers and school executives, it was concluded that evaluation of student studies from these views is cared by both school executives and school principals, and increasing the success is aimed. It was concluded at the end of this research that educational leadership influences student success positively.

Krug (1992a) investigated in his research the relationship between the educational leadership of school principal and success of students. As a result of this, a positive relationship was detected between educational leadership and educational activities and success of students (Gökyer, 2004). In order that school principal could be successful in leadership, student success should have assessment and evaluation both continuously and systematically (Gümüşeli, 2001). Educational leadership is a kind of leadership directly linked to students and educational activities. So, we can suppose that educational leadership aims at increasing student success by evaluating the students.

As a result of this research, it was concluded that school executives encourage students to study and learn in order to influence and improve their success. It was concluded from the study conducted by Gümüşeli (1996) on 'educational leadership' that school executives 'always' perform their duties of encouraging students for learning.

5.4. Views on What is Done for Supporting Teachers

It was seen that a great number of participants thinks it is necessary to support teachers financially as a support. It was concluded that financial resources in schools are not sufficient, and this affects teachers negatively. We can say that when school executives provide financial resources for teachers would affect and motivate them in a positive way. It can be concluded that financial support of school executives would motivate school teachers. Educational leaders should; be the leaders of school success, bring the quality of education to the forefront, provide the resources that teachers need, participate in learning and teaching activities at schools instead of only observing, and finally establish efficient communication within school (Özdemir & Sezgin, 2002). It was seen that providing teachers with moral support is the common view of participants for supporting teachers. It was concluded that it is pleasing for teachers that school executives give them a back, support and encourage them. It was clearly stated by the participating teachers that moral support as well as financial support is important and necessary. Educational leaders should support teachers in performing their duties better and improving themselves (Aksoy, 2006). It was seen that there is expectation in terms of organizing school environment according to teachers among school executives from the view of most of the participating school executives and teachers that school environment should be organized according to teachers. It was concluded that it is pleasing and satisfying for teachers to be working in a school environment which is organized according to them. As it can be understood here, we can say that leadership features are important for creating a happy, peaceful and efficient leaning environment. In this research it was seen that teachers are reluctant in performing their duties in case they are not supported morally and for this reason, they have some problems in showing their educational leadership behaviours. It was concluded that a feeling exhaustion occurs in teachers who do not appreciated by the school principal. It was concluded from this research that educational leadership behaviours are influenced negatively by the inadequacy of environment and possibilities.

Sözüeroğlu (2006) stated in his research that educational leadership behaviours of school principal are shaped by the conditions of the school that the school principal works in, and there should be some changes that will allow school principals give services as educational leaders and create the environment and conditions that will allow school executives to be educational leaders and show educational leadership behaviours.

5.5. Views on Occupational Development of Teachers

It was concluded from the view that approximately half of participating school executives and a small number of teachers think school teachers should use classical methods that they face problems in terms of professional development as they adhere to classical methods, they do not follow up new methods and close themselves to the innovations. It was observed that there is a small number of teachers who adopt student-centered education. We can say that there is a need for educational leadership in many schools for changing, developing, convenient to the period and student-centered education. It was observed from the view of participants that school teachers should be innovative that a small number of teachers complies with the changing conditions and improve themselves. Nearly half of the participating teachers was seen to improve themselves and conduct student-centered education by attending certain appropriate courses to them in accordance with the changing environmental conditions. So, it can be said that there is a need for educational leadership that will conduct educational leadership in schools, design new programs and bring them to teachers and make them applied through impressive power.

It was concluded from the view that participants should know about educational programs that teachers should have knowledge about learning and teaching programs order to improve themselves in their profession. We can say that teachers who follow up educational programs and are informed about the innovations become more successful. We can conclude that the presence of educational leadership in schools will increase the quality of learning and teaching activities. From the answer that school teachers need in-service courses it was concluded that many participating teachers have certain expectations from the ministry about their professional development, and they are in need of in-service courses that will be organized by the ministry. It was observed that some participating teachers deem the mentioned courses as necessary both to improve themselves and get promotion.

In order to perform educational leadership behaviors in this research, it was concluded that teachers need information about the curriculum, to be innovative and to be informed about in-service courses. Akdağ (2009) studied the perceptions on program development and educational leadership of school executives. The teachers suggest principals to get more information about the content of new programs, to diminish their work load and help them more with regard to the program, and to organize in-service programs that will bring them educational leadership behaviors. Besides that, teachers stated that principals should spare more time to the innovations with regard to teaching and learning, communication with students, social activities, educational activities, school environment, preparation of school programs based on the targets and cooperation with teachers. In the research conducted by Akdağ (2009) the perceptions of school executives on program development and educational leadership were measured, and it was concluded it is essential that principals get more information about the content of new programs, diminish teachers' work load and help them more with regard to the program, and organize in-service programs that will bring them educational leadership behaviors. It was concluded from this study that there are some problems in professional development of teachers, and educational programs as well as education methods should be changed in order that educational leadership behaviors could be realized. Aksoy (2006) concluded from his research that appropriate conditions should be ensured so that school executives could do their duty of being education leaders, and some necessary changes should be done in regulations by revising educational policies.

5.6. Views on What is Done for Providing the Team Spirit within School Staff:

The results obtained from the findings belonging to this dimension can be shown as more effective learning and teaching studies could be done in organizations that are accepting families' support and this contributes to the success of students positively based on the view on including both schools and families to create the team spirit of the participants. It was observed that it could create a positive learning and teaching environment in school to create synergy by organizing common activities and spending time together. We can suppose that those teachers and administrators in schools having team spirit work more happily and efficiently. It was stated by the participants that teachers and students socialize thanks to school trips activities, and thus, better learning and teaching studies are carried out. It was concluded that more powerful relations are established between teachers and students in schools where there is good team spirit, and this contributes positively to school environment. It was observed that a large number of school administrators and teachers is willing to organizing sportive activities and participating in such activities in order to create team spirit. We may think that common activities could direct to have fun and spend time together, and this will reflect into the education within institution positively.

Educational institutions are the organizations both influencing the environment and being influenced by it (Balkar, 2009). They are influenced negatively from developing relationships with the environment as parents' meetings have the aim of learning grades of students in some studies (Balkar, 2009). The assets influencing the school form the school environment. Educational organizations both influence their environment and they are influenced by it. Education is not a process happening only within schools. Because it can be observed that children's house and environment influence their educational process substantially. It was seen in this research that association within organization and being a team is important in order that educational behaviors could be actualized. Sönmez (2010) concluded that school executives successfully execute their roles of educational leadership by creating a regular and harmonious environment at school apart from supporting teachers.

5.7. Views on what is Done for Developing Environment and School Cooperation

The results obtained from the findings relating to this dimension demonstrated that most of the participating school executives and teachers place emphasis on parent-teacher association in order to improve the school cooperation based on the view that parent-teacher association meetings should be held. The coherence of student-family-teacher triplet and the importance of exchanging information were stated in these meetings. We can say that educational leadership is related to learning and teaching activities, also, it is necessary to improve environmental development with institutions in order to increase the quality of such activities. It was concluded from the view of participating school executives and teachers on ensuring visits to the institutions, organizations and individuals that important people and institutions give important support to the school within the environment apart from the ministry. Both institutions-organizations and school are introduced more as a result of such visits, and the connection with the environment is ensured. It was clearly stated by the teachers that this relationship has positive contributions. It can be thought that it is essential for institutions to establish good relationships with the environment in bringing up individuals who will shape and carry further the society. It was made a conclusion that technology is used easily and densely in schools; thus, communication is ensured quickly and in short time considering the view of nearly all of participating school executives and teachers on the fact that the school and teachers reach parents via SMS or telephone. It was observed that participating school executives and teachers bring forward the idea that parents should be visited equally by the school. The result that it could be easier to get support from the environment through the visit of people in immediate environment to improve the cooperation of environment and school can be inferred. We can say that educational leadership of the administrators is important in finding solution to the problems faced in schools thanks to such relations and in getting support. It was concluded from the view of school executives and teachers on providing financial support for school that the financial resources of the school are insufficient, that is why they try to generate income from the surroundings to create resources obligatorily. So, it can be supposed that a good school administrator can combine the opportunities within the environment through the means possessed and provide financial support from the environment by using educational leadership.

It was concluded from this research that school executives make an effort for ensuring the communication between school and environment. Şişman (2002) detected the execution of educational leadership behaviors of school executives in his educational leadership research study. It was concluded that behaviors of creating educational environment of school principals are shown as ‘usually’ or ‘always’

It was concluded from this study that some school executives show educational leadership behaviors, and they try to behave accordingly with the vision and mission of the school. Aktepe and Buluç (2014) demonstrated in their research that school executives think about the vision and mission of the school while showing behaviors of educational leadership, and they act accordingly. Similar results were obtained in both studies.

It was observed in this research that school executives believe educational leadership influences student success positively and it has positive contribution to solve conflicts and problems. Bozkurt (2015) conducted studies on ‘educational leadership and success of students. He concluded in this study that educational leadership influences not only the program but also success of students and academic success too.

Arslandaş & Özkan (2015) conducted a study on the behaviors that are used in solving discrepancies and educational behaviors that school executives show. Similar results were obtained in both studies.

It was concluded that leadership behaviors are related with being open to innovations based on the results of this research. Şentürk (2016) detected the effect of transformational and interactionist leadership behaviors on individual innovativeness level of the employees. It was concluded in this way that the two researches have some similarities regarding their results.

It was observed in this research that a number of school executives shows educational behaviors and pays attention to the objective of the school. Şişman (2016) who measured the school leadership perceptions investigated the school objectives, educational program, supporting teachers and quality of students. It was observed in this research that school executives show educational behaviors. Similar results were obtained in both studies.

It was concluded from this study that common studies in which information could be given to teachers and administrators could be conducted. Kış (2013) conducted a study on the meta-analysis on the views of teachers and administrators regarding educational leadership behaviors of school executives. As a result of this, it was discovered that common studies that could give information to both teachers and administrators in relation to educational leadership of school executives.

RESULTS AND SUGGESTIONS

The importance of bringing up individuals who know the society, are productive and can solve the problems faced within the environment is enormous. It can be summarized that school executives and teachers are aware of school objectives and they try to realize educational activities consciously. It was stated that both school executives and teachers act in accordance with the school objectives. We may think that educational activities in schools are carried out to socialize students. It was observed that the success in education could realize with the increase of individuals who can solve problems. At the present time, it is explicitly stated by both school executives and teachers that individuals have difficulties in solving problems. We can say that educational leadership role of school executives is quite important for training individuals who can adapt to developing and changing environmental conditions and cope with the emerging problems.

The analysis of the ratios and themes of participant views belonging to the administrators and teachers was made in order to determine the efficiency of teachers in teaching lesson within classroom. Common view of more than half of school executives and nearly half of teachers is that the resources that exist in the school or supplied by the ministry are not sufficient for meeting the needs; there is an effort for creating resources by receiving help of the school management, teachers and the surroundings; major problems are faced in creating such resources; and educational activities are influenced negatively due to the lack of resources. It is believed that educational leadership activities will be influenced negatively in schools where there is a lack of resources. Teachers postulated that they face problems in descending to the level of students, listening to, understanding them and making students love them. We can see that most of the teachers improve themselves on this issue, while some others are closed to improve themselves. It can be concluded that it is quite important for educators to improve themselves if we consider that communicational skills should be good to carry educational leadership. Half of both school executives and teachers share the same idea; furthermore, they pointed out that they cannot administer the class well, as they have problems in ensuring discipline within classroom due to some reasons like crowded classroom or the fact that teachers do not know the students well enough. It can be supposed that educational leadership is more needed in these schools as it requires a good management skill.

It was concluded that a large number of both school executives and teachers monitor their students by observing them at school, within classroom, during a lesson, in breaks and outside school also when taking into consideration monitoring student success. So, we can say that school executives as well as teachers have responsibilities in providing students with quality education; also, observing students continuously will influence student success positively. Common view of nearly all teachers and school executives is that the studies of students are followed up both verbally and in written form. It was concluded that both school executives and teachers care about the assessment results or school reports of their students. Particularly, teachers stated that they pay attention to the studies of their students straightforwardly. It can be reckoned that educational leadership is necessary for increasing student success.

Especially most of the school executives stated sadly that they use up financial supports that they have regarding contributing to education within the scope of determining the efforts made for supporting teachers, though, this is not enough, and they attempt in different ways to provide financial support, but they have problems in meeting them. Half of the participating teachers indicated by complaint that financial possibilities are tried to be provided but this does not suffice for meeting the needs. More than half of the teachers explicitly stated that it is a pleasure for them to be with teachers, motivate them and provide teachers with moral support as well as providing them financial support. School executives stated that teachers have a major role in having success in educational activities, and it is obvious that taking into consideration the demands and needs of teachers encourages teachers while organizing learning environment. Half of the participating teachers stated that educational activities in an environment that is appropriate for teachers are more fertile. As it can be understood here, educational leadership features are important for creating happy, peaceful and productive learning environment.

Nearly half of school executives asserted that teachers use old methods and techniques instead of adapting themselves to innovations and this could bring several problems under the scope of determining the qualifications of teachers regarding their professional development. A few teachers pointed out that teachers provide old and teacher-centered education to their students. We can infer here that there is need for educational leadership in many schools for a convenient and student-centered education. Nearly half of the participating teachers asserted that teachers improve themselves by complying with the changing environmental conditions by attending various courses and try to create student-centered educational environment, change and renew themselves.

Participating school executives and teachers equally stated that teachers who are aware of the changes by following educational programs and comply with them become more successful in their occupations. We can say that having knowledge about educational programs, following up innovations and changes are the factors increasing teacher success. Accommodating educational leadership in school is believed to increase the quality of educational activities. A few school executives stated their opinions on the fact that teachers should participate in the courses organized for renewing their knowledge. Many participating teachers indicated that they are willing to take part in in-service training courses that are organized in return for certificate, and these courses let them improve themselves. We can infer here that teachers are willing to participate in in-service training courses with certificate.

In order to create team spirit within school cadre, the analysis of themes and ratios of participating administrators and teachers' views was made. It was observed that the presence of interaction between parents and schools has a positive effect on the success of students. We can say that the cooperation of parents with schools has positive contributions to the education. That school workers organize activities, spend time altogether, show common behaviors and make decisions jointly as if they were a single body when it comes to the profits of school environment creates a positive situation in school environment. It can be concluded that teachers and administrators in schools having team spirit are happier and more productive. It was observed that half of school executives and nearly half of the teachers do denunciative studies with regard to creating team spirit. A large number of both school executives and teachers builds consensus in relation to creating team spirit with sportive activities. We may think that common activities could direct to have fun and spend time together, and this will reflect into the education within institution positively. It can be concluded that educational leadership is related to learning and teaching activities, moreover, it is necessary to develop environmental communication and institutions in order to increase the quality of such activities. Half of the school executives and less than half of the teachers stated that the school is introduced and thus supported as a result of the visits of charitable and important people in the region and the institutions such as ministry of education, municipality and military in providing both financial and moral profits to the school. It can be thought that it is essential for institutions to establish good relationships with the environment in bringing up individuals who will shape and carry further the society. The school executives and teachers reach the parents via telephone, Internet and SMS intensively. The usage of Internet in schools with technological improvement causes the communication between school and parents to be established easily in short time. It was observed that almost all of school executives and teachers could reach parents via telephone whenever they want. People who care about the environment and are sensitive were told that visits were made on behalf of the school to those having cases like birth, death, disease and having accident. It was concluded that educational leadership of the administrators is important in finding solution to the problems faced in schools thanks to such relations and in getting support. It can be supposed that a good school administrator can combine the opportunities within the environment through the means possessed and provide financial support from the environment by using educational leadership.

RECOMMENDATIONS

1. With regard to the determination of school objectives, we can say these are to train good individuals, bring students professions, socialize students, bringing up individuals who can solve problems in order that educational leadership could be realized. The school executives could be suggested to learn well about school objectives to be a good education leader.
2. Regarding the determination of teachers' qualifications in teaching lessons within the class, it can be said that they are short of school resources and thus, they are affected negatively by that. Following up the innovations can be suggested to teachers for creating resources to the school, developing communication skills and having good management skills in order to make educational leadership.
3. In relation to the determination of student success, it can be thought that it is necessary to continuously observe students and evaluate the studies of students in order that students could reach their goals successfully. They can be suggested to follow up and evaluate the studies of students in order to conduct educational leadership.
4. With regard to the determination of what is done for supporting teachers, it can be thought it is necessary that school executives support teachers both morally and financially, and organize school environment according to teachers. In order to create an effective and productive learning and teaching environment, it can be proposed to support teachers both morally and financially, and organize school environment according to teachers.

5. With regard to the determination of feelings and thoughts about professional development of teachers, it can be said that it is necessary to not to adhere to conventional methods but to follow up new methods. It can also be suggested to follow up innovations that will adapt to developing conditions, to learn and put into practice these innovations and to have knowledge about educational programs for a good educational leadership.
6. In relation to the determination of feelings and thoughts about what is done for providing the team spirit within school staff within the school cadre in order to create team spirit, it can be thought that participation of parents in the activities and creation of synergy will reflect into the success of students. We can say that school executives have major roles in creating a productive and happy environment within the school. Organization of some activities such as excursion, observation and sportive activities in order to do educational leadership can be proposed to create team spirit.
7. In concern with the determination of feelings and thoughts about what is done for improving the environment and school collaboration, it is necessary to hold parent-teacher association board meetings; visit the institutions and organizations and entities; contact with parents via telephone and SMS; visit parents; get financial support of parents. We may think that educational leadership is related to learning and teaching activities, also, it is necessary to improve environmental development with institutions in order to increase the quality of such activities. So, it can be proposed that a good school administrator can combine the opportunities within the environment through the means possessed and provide financial support from the environment by using educational leadership.

REFERENCES

- Akdağ, A. (2009). *İlköğretim okul yöneticilerinin öğretimsel liderlik davranışlarının yeni ilköğretim müfredatının uygulanmasındaki etkililik düzeyi*, (Yayınlanmamış Yüksek Lisans Tezi). Kocatepe Üniversitesi, Afyon.
- Akgündüz, A. (2004). *Lider yöneticinin el kitabı*, İstanbul: Genç Beyin Yayınevi.
- Aksoy, E. (2006). *İlköğretim okulu yöneticilerinin öğretimsel liderlik rolleri (Aydın İli Örneği)*, (Yayınlanmamış Yüksek Lisans Tezi). On sekiz Mart Üniversitesi, Çanakkale.
- Aktepe, V. ve Buluç, B. (2014). Sınıf öğretmenlerinin algılarına göre okul yöneticilerinin öğretim liderliği özelliklerinin değerlendirilmesi. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi* 34(2):227-247
- Arın, A. (2006). *Lise yöneticilerinin öğretim liderliği davranışları ile kullandıkları karar verme stratejileri ve problem çözme becerileri arasındaki ilişki düzeyi*, (Yayınlanmamış Yüksek Lisans Tezi). Osmangazi Üniversitesi, Eskişehir.
- Arslandaş, İ. ve Özkan, M. (2015). Okul yöneticilerinin çatışma çözmede yıkıcı olmaları ile öğretim liderliği arasındaki ilişki. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*.
- Balkar, B. (2009). Okul aile iş birliği sürecine ilişkin veli ve öğretmen görüşleri üzerine nitel bir çalışma, *Çukurova Üniversitesi Eğitim Fakültesi Dergisi*, 3 (36), 105-123.
- Blase J. and Blase J. (1999). Effective instructional leadership:Teacher's perspectives on how principals promote teaching and learning in schools. *Journal of Educational Administration*, 38(2), 131-140.
- Bozkurt, S. (2015). Instructional Leadership Behaviors of Principals in Terms of Teaching Process and Students Retrieved from www: <http://dergipark.gov.tr/download/article-file/210386>
- Can, N. (2007). İlköğretim okulu yöneticisinin bir öğretim lideri olarak yeni öğretim programlarının geliştirilmesinde ve uygulanmasındaki yeterliliği, *Eğitimde Kuram ve Uygulama*, 3 (2), 228-244.
- Gökçer, N. (2004). *İlköğretim okulu yöneticilerinin öğretim liderliği rollerini gerçekleştirme düzeyleri ve bu rolleri sınırlayan etkenler* (Yayınlanmamış Doktora Tezi). Ankara: Hacettepe Üniversitesi, Ankara.
- Gümüşi, A. İ. (1996). *İstanbul ilindeki ilköğretim okulu yöneticilerinin öğretim liderliği davranışları*. İstanbul: Yıldız Teknik Üniversitesi Yayınları
- Gümüşi, A. İ. (2001). Çağdaş okul müdürünün liderlik alanları, *Kuram ve Uygulamada Eğitim Yönetimi Dergisi*, 28, 531-548.
- Gürsun, Y. (2007). *İlköğretim Okul yöneticilerinin öğretmenler tarafından algılanan öğretimsel liderlik rolleri ile iletişim tarzları arasındaki ilişkinin incelenmesi (Kartal İlçesi Örneği)*, (Yayınlanmamış Yüksek Lisans Tezi). Yeditepe Üniversitesi, İstanbul.
- Helvacı M. ve Aydoğan İ. (2011). Etkili okul ve etkili okul müdürlerine ilişkin öğretme görüşleri: *Uşak Üniversitesi Sosyal Bilimler Dergisi*,4(2), 41-60.

- Krug, E. (1992). Instructional leadership: A *Constructivist Perspective*, *Educational Administration Quarterly*, 28 (3), 430-443.
- Leithwood, K. (1992). The principal's role in teacher development, teacher educational change, London: Flamer.
- Miles, M. B. Ve Huberman, A.M. (1994). *Qualitative data analysis : An expanded sourcebook* (2nd ed.) California: Sage.
- Özberk, Ö. (2015). *Ortaöğretim okullarındaki okul yöneticilerinin liderlik stilleriyle öğretmenlerin mesleki adanmışlığına yönelik öğretmen görüşleri*. (Yayımlanmış Yüksek Lisans Tezi). Yakın Doğu Üniversitesi, Lefkoşa.
- Özdemir, S. ve Sezgin, F. (2002). Etkili okullar ve öğretim liderliği, *KTMÜ Sosyal Bilimler Dergisi*, 3, 266-282.
- Öztürk, N. (2005). *Bulgaristan ve Türkiye'deki okul yöneticilerinin yöneticilik ve liderlik davranışları, Sofya ve İstanbul illeri örneği*. (Yayımlanmamış Yüksek Lisans Tezi). Yıldız Teknik Üniversitesi, İstanbul.
- Smith, W. and Andrews, R. (1989). *Instructional Leadership*: Va; Association for Supervision and Curriculum Development (ASCD) Press.
- Sönmez, A. (2010). *Ortaöğretim okulu yöneticilerinin öğretmenler tarafından algılanan durumsal liderlik stilleri ile öğretimsel liderlik rolleri arasındaki ilişkinin incelenmesi (Bahçelievler Örneği)*, (Yayımlanmamış Yüksek Lisans Tezi). Yeditepe Üniversitesi, İstanbul.
- Sözüeroğlu, A. (2006). *İlköğretim okulları yöneticilerinin öğretim liderliği davranışlarının değerlendirilmesi*. (Yayımlanmış Yüksek Lisans Tezi). Selçuk Üniversitesi, Konya.
- Şentürk, K. (2016). *Dönüşümcü ve etkileşimci liderlik tarzlarının bireysel yenilikçiliğe etkisini belirlemeye yönelik bir araştırma*. Journal of Mehmet Akif Ersoy University Social Science Institute; p173-198, 26p.

Evaluation of Teacher's Visits of the School Administrator's Leadership Styles

Behcet ÖZNACAR

behcet.oznacar@neu.edu.tr

Near East University, North Cyprus

Halil GAZİLER

halilsherife@hotmail.com

ABSTRACT

This study was carried out by investigating the literature. In the study, it was aimed to determine how 'school administrators' in the primary schools in the TRNC evaluated the leadership styles of teachers and their teachers' perspectives on professional commitment to the profession. This work is a qualitative study. Participants of the study were selected from primary school teachers affiliated to the Ministry of National Education of the Turkish Republic of Northern Cyprus in the 2016-2017 school year. Participant 20 teachers were reached by snowball sampling method. This study was formed by a case study. Using semi-structured interview techniques, we have been asked to answer semi-constructive questions about the research topic. The information gathered during the interview was interpreted by data analysis and related themes were created and expressed with the help of tables. When the responses of participant teachers are examined as a result of this research; It is seen that school administrators have adopted patience, understanding, equal and positive leadership styles. Besides this, it is stated that there are school administrators who do what one side wants. Teachers have enjoyed this profession, have fewer working hours, have a good reputation for their profession, When doing this profession, they are complaining about the lack of equipment, the excess of students in the classroom, the indifference of their families and students. According to the behaviors of the school administrators, there are teachers who feel themselves worn out in this profession, as well as teachers who feel themselves well and increase their motivation and dedicate themselves to this profession according to the leadership styles of the managers.

Key Words: Devotion, leadership, organization, teacher, school principal, primary school

INTRODUCTION

Schools are the most important educational institutions of societies. If we consider educational institutions each as an organization, there is need for a leader managing and leading each of these organizations. Those who are leading the organization in educational institutions are the school principals. If we should consider school principals as leaders, the most important tasks in reaching the goals of organization's objectives belong to the leaders who are school principals. According to Şişman (2012), leadership is the ability of activating the workers in a certain organization to reach the aims.

Leader is one of the most important and constant factors in an organization. It is essential that school principals who are in managing position are in interaction with teachers (Aydın, 2014). Teachers have an active role in reaching the targeted success within the organization. Teachers are expected to adapt themselves to their work in reaching the targeted success. That teachers practise their profession willingly will increase success of the organization they pertain to (Armstrong, 2008).

In cases where teachers adapt themselves to their work and get pleasure while performing it, they become more motivated. Considering institutional educational organizations, it is very important that teachers who are working adapt themselves to their work in order to be successful. If teachers become successful in their work, it will lead the organization to the desired level. Devotion to the profession is one of the factors influencing teacher success. Devotion to the profession is related to be volunteer for carrying out the work, struggle and concentrate on the work. Devotion to the profession is related to the exhaustion, and it is just the opposite of it (Kanste, 2011). Self-devotion to teaching identifies with doing a job properly (Eroğlu 2007). The more a profession is cared, the more self-devotion will increase.

Devotion to the profession is related to how teachers who work in an organization feel. Teachers who enjoy their profession will adapt themselves more to their occupation (Şeşen, 2010). Self-devotion behaviour of a teacher against the profession depends on the administrator who is the principal of the school depending on his/her communication with his/her colleagues. Both the teacher himself/herself and his/her interaction with the factors forming the organizational structure in the school influence his/her motivation and success accordingly.

The school executives who are in administrating position have an important role with regard to increasing professional devotion of teachers. In consideration of this information, we will try to stress on the impact that leadership styles which are used by the administrators on teachers. The education has an important place for a society to exist and develop. Individuals that are brought up shape the community.

The more teachers adapt themselves to their work, the more the motivation will increase. When the desire and interest increase, the productivity increases too. Thus, the process of reaching the desired objectives within that organization will be performed appropriately. It can be observed that there is decrease in students' success in educational institutions. There are difficulties in performing the objectives of schools. The information learned cannot be enough in solving problems, school administrators cannot use the schools sources and school staff, and problems are faced in schools. Leadership types of school principals and accordingly the issue of teachers on their commitment to the profession are quite important in order to increase students' success, to realize the goals of schools, to make use of school resources efficiently and to find solution for the problems faced in schools. There leadership styles that school executives determine to their delight. The administrators are expected to apply appropriate leadership that will allow them to reach the learning and teaching objectives. Besides that, it is stated that it is necessary for a teacher to adapt himself/herself to the profession. Consequently, leadership styles of school executives and evaluation of teachers' views on professional devotion will be investigated in this research.

METHOD

Model of the Research

As teachers' views on professional devotion and leadership styles of primary school executives are investigated in this research, the qualitative research method was used. The qualitative research method is the one where mostly interviews, observations and documents are used (Yıldırım & Şimşek, 2008).

In this research, qualitative case study was used. It is a method where all details are studied in a case down to the last detail (Yıldırım & Şimşek, 2011). In this research, semi-structured interview technique was used. The interview technique which is formed in the direction of the predisposed and received answers is called semi-structured interview technique. It is the research method where a matter is taken in hand and studied in details and the opinions of those participating in the research are taken regarding the issue (Yıldırım & Şimşek, 2011).

The Universe and Sample / Research Group

It is called study group for the small unit that represents a group on which a research is conducted. Study group of the research consists of teachers working in primary schools, affiliated to the Ministry of Education of Turkish Republic of Northern Cyprus in 2016-2017 academic year. 20 administrators who were selected by snowball method within the indicated study group form the sample of the research.

It is called snowball sampling to the sample which is formed by finding a person who will contribute quality information to the research and then reaching another upon recommendation of the other person and reaching another (Yazıcıoğlu & Erdoğan, 2004). The effective method which is formed by the participants and reaching broad, rich and deep information is called snowball sampling (Yıldırım & Şimşek 2011).

Data Collection Tool and/or Technics

The data was collected through semi-structured interview form in this research. 4 open-ended questions were found at the end of researches that were prepared by reviewing literature. The researcher may conduct a more detailed study by adding new questions to the current research whenever he/she wishes (Türnüklü, 2000). The questions to be answered by the teachers were revealed thanks to expert view. Later on, the real interviews were realized after data came to light upon they were applied on three teachers.

Data Analysis

The data that were obtained from the participants were analyzed by content analysis. The data obtained is the method allowing carrying the content of the part (Stemler, 2001). It is called content analysis to organize and code the obtained data and crate categories (Yaman, 2010). Detailed data is collected and identified in this method and so, the conceptions are formed. The participants are given numbers, and interview forms are filled. The data is separated into proper parts for studying and named and coded evidently to show the conceptions. Themes are drawn from comprehensible answers by detaching codes separately in sections. Each answer belonging to the participants is shown in inverted commas in italics and it is indicated between parentheses which opinion belongs to which participant.

Validity and Reliability of the Research

The informations taken from the participating teachers in the research are given the same as they were uttered. It was ensured that the informations gathered do not conflict and that they are convenient to the conceptions in the research. The duration of the interviews was extended in necessary cases. Persuasiveness was tried to be provided like this.

In order to make the research reliable, the consistency of codings was controlled and calculated by an experienced lecturer. Furthermore, the details about the place of the research were mentioned, and the obtained data was preserved for the next research.

Table 1: Feelings and thoughts on managing characteristics of school principal.

Themes	Percentage (%)				
	Indicating	Non Indicating	Total	Indicating	Non Indicating
School principals' state of patience					
Favouritism of school principals					
School principals' state of being a good listener	11	9	20	55	45
Equality of school principal	12	8	20	60	40

In Table 1, 60% of teachers stated their views on the fact that school principals show equal behaviours to teachers. It can be concluded that when school executives show equal behaviours among leadership styles increases teachers' devotion to their profession.

Table 2: Reasons of selecting teaching profession

Themes	Percentage %				
	Indicating	Non Indicating	Total	Indicating	Non Indicating
Scarce of working hours	1				
Loving thier profession	8	12	20	40	60
Length of holidays	7	13	20	35	65
State of being reputable of teaching profession	4	16	20	20	80

Considering Table 2, 50% of teachers indicated their views on the reasons of selecting this profession as the scarcity of its working hours. 40% of the participating teachers stated that they love their profession. Devotion of teachers who love their job to their profession will increase more and more.

Table 3: The problems that teachers face

Themes	Percentage %				
	Indicating	Non Indicating	Total	Indicating	Indicating
Excess of student number					
Lack of equipment	8		20	40	60
Indifference of students and parents	12	8	20	60	40
Environment of teachers in school	7	13	20	35	65

Considering Table 3, indifference of parents and students come first among the leading problems of 60% of participating teachers. We face indifferent parents and students as an important effect for teachers in executing their profession. Devotion of teachers to their profession reduces due to indifferent students and parents.

Table 4: Influence of school principal behaviours on teachers

Themes	Percentage (%)				
	Indicating	Non Indicating	Total	Indicating	Non Indicating
Feeling good					
Feeling exhausted					
Feeling motivated higher	12	8	20	60	40
Developing negative attitude towards school	7	13	20	35	65

Based on Table 4, 50% of teachers point out that they feel good compared to school principals' behaviours. However, a group of teachers at rate of 40% states that they feel exhausted depending on management style of the school principal. We can conclude that devotion of teachers, working in the schools of the administrators adopting positive leadership style, to the profession is higher.

5.1. Views of school principal about the management.

Participants who stated that school executives are patient attract the attention too. It can be inferred that relations within the school will become more regular and problems will be solved in a better and easier way in mutual communication as long as school principal is patient. We can say that organizations hosting problem solving and patient administrators are more successful. According to Karagöz (2008), teachers are affected positively by ethical, understanding and affectionate behaviour of school executives.

We can infer from the view that school executives show behaviour of favouritism that school executives are the leaders who adopted authority leadership style. As participants find this behaviour of school executives as negative, we may think that school executives are affected negatively by leadership style. Leadership should show behaviours of not prejudicing against the workers and equating behaviours. Should the school executives show authoritative behaviour and do whatever they wish and act in favor of each group will decrease the devotion to the profession by reducing the motivation.

The workers who state that their school executives are good listeners express that their administrators adopt problem-solving and solution producing leadership styles. Such administrators who pay attention to their subordinates and adopt behavioural leadership style become very successful within the organization. Their behaviours of paying special care to communicational skills among leaders and using them within the group are important (Şimşek, 2006).

It can be inferred that school executives show democratic leadership behaviours from the thoughts of most of the participants that their school executives behave equally. As a result, it can be said that they work in harmony with those people in the organization and responsibly for the workers within school organization. Alıç (1985) mentioned in his study that the productivity and motivation of a teacher will increase in case that school administrators show equal leadership behaviours in the management of the related school.

5.2. Views on the reasons why they select teaching profession

Half of the participants unifies on the view that working hours of teaching regarding the selection of teaching profession should be less. We can say that they practice their profession willingly as they have enough time to do their personal affairs and get motivated by having rest.

Nearly half of the teachers stressed that they selected their profession willingly and consciously, and they are never regretful of doing this profession. Based on the researches conducted by Dalay (2007), a teacher should love this profession and get satisfied by it in order to perform such a duty. In this context, their productivity and quality of work will increase considerably if teachers love and devote themselves to their profession. Their devotion to the organization will increase accordingly.

A part of the teachers stated straightforwardly that they selected this profession as holidays are long. They stated that they could allocate time for themselves and their families, and they could get plenty of rest. Devotion of those teachers who take a rest and get motivated to their profession will increase in a positive way.

Very few teachers who participated in the research pointed out the view that teaching is an esteemed profession in choosing a profession. It is very important that the profession of teaching is esteemed by the society where it exists for devoting oneself to the profession. That individuals do such a profession which is approved and esteemed by the society leads them to select and do it willingly. A teacher who is motivated to his/her work will increase the productivity by self-devotion to the profession, and accordingly the motivation will reach the highest level (Eroğlu, 2007).

5.3. Views on the problems that teachers face

Half of the participants indicated the crowded classrooms among the major problems they come across. Crowded classes will reduce the productivity. The resources should be benefited at best (Şişman 2012). As the crowded class number will increase the load of teachers, it will decrease the quality of learning and teaching environment accordingly.

The participating teachers focus on the fact that there are basic problems in equipment insufficiency. Insufficiency of equipment hinders reaching the goals. For this reason, teachers who are working in schools having lack of equipment and resource cannot devote themselves to their profession exactly Türkan (1999). It was concluded that teachers have problems, and these problems disaffect them towards their profession. The problem of resources, equipment and management reduces their devotion to the profession.

The fundamental problems that teachers face in the school can be shown as the indifference of students and parents. Particularly, the interest of those families having socio-economic problems with their children seems to be less than other families.

Some of the participating teachers think that environment is among the fundamental problems at school. The participants stated that there are conflicts due to disagreements among teachers in school environment. It can be supposed as these conflicts disincite teachers from their profession and affect their devotion to the profession in a negative way. Realization of devotion in an environment where there are less problems is easier (Celep, 2000).

5.4. Views on the effect of school executives behaviours on teachers

Half of the participants of the research has a consensus on the fact that democratic and positive behaviours of administrators let them feel good. If the administrator shows ethical and effective behaviours, teachers will feel better at school. Teachers increase their confidence on their administrator who behaves them ethically (Yılmaz, 2005).

We can comment that nearly half of the participating teachers are influenced negatively by school executives' behaviours, and they get the impression of exhaustion as a result. School executives who show authoritative behaviours cause teachers to feel exhausted. That school executives do not care about the views of teachers reduces teachers' productivity; thus, hinders teachers' devotion to their profession (Karahan, 2009).

Most of the teachers participating in the research have the opinion that it increases their motivation when school executives show positive and in good faith behaviours. Teachers, whose motivation increases, unite in the opinion that they devote themselves more to their profession and job (Zöğ, 2007).

A part of the teachers mention that they develop negative attitudes towards the school as a result of the behaviours of their principals. A teacher working in a school where everybody acts unattendedly, decisions are made randomly and everyone acts according to their wish develops bad feelings about the school (Eren, 2008).

RESULTS AND SUGGESTION

The leadership styles that school administrators have shown influence teachers. We can conclude that there is interaction between the devotion of teachers to their profession and leadership styles that school executives have shown. School executives specify and influence devotion of teachers to their profession. The opinions of teachers were consulted regarding the determination of school principal's managing characteristic.

Some of the teachers defended the idea that a patient school principal is insightful against teachers. He/she communicates with them and behaves actively in solving the problems. It can be concluded that as the productivity of the teacher working with such an administrator will go up, his/her devotion to the profession will increase accordingly.

Many teachers point out that there are biased school executives. Such school executives who are biased disturb everyone in school and cause working environment to go bad. The motivation of teachers in learning and teaching environment will reduce because of biased and unfair behaviours, and therefore, their devotion to the school will diminish.

Most of the teachers stated that school executives are good listeners. The fact that school principals are good listeners, it can be concluded that teachers will feel more at peace and in comfort in workplace environment. It can be concluded that an administrator who listens to his/her interlocutors and shows empathy will make positive contributions to the school and teachers.

More than half of the teachers work with an equal school principal. A fair school principal provides a democratic atmosphere at school. Such a democratic and fair atmosphere contributes to both school and teachers. It can be concluded that showing fair behaviours will increase devotion of teachers to their profession by increasing their creativity as well.

The themes were analyzed and calculated according to the answers given by teachers for the reasons why they selected this profession. Half of the teachers stated that they selected their profession as working hours are less. It is quite important that teachers have free time, allocate time for themselves afternoon and maintain their educational works outside the school. What is expected from teachers is that they take a rest and focus on their profession. As working part time will increase teachers' performances, it can be inferred that devotion to the profession will be influenced positively.

Many teachers pointed out that they carry out their profession voluntarily. We can infer that a teacher who loves his/her profession will devote himself/herself to the work more. Doing a job voluntarily and enjoying it is quite important in terms of both motivation and performance.

We face teaching as a profession having been esteemed by societies since history. Even though the distinction reduces in today's conditions, teachers expect to be respected by the society. One of the reasons that teachers select this profession is the respectability.

Results were drawn under the scope of the views that teachers stated regarding the problems they come across. Half of the teachers pointed out that the crowd reduces the productivity. Crowded classes reduce significantly the productivity of teachers. As the number of classes is crowded, teachers cannot deal with every student as they wish, and they hardly could teach a lesson. As crowded numbers will decrease the motivation, teachers will feel exhausted. Exhausted teachers would not be able to devote himself/herself to the work and thus, devotion to the profession will decrease.

Nearly half of the teachers stated that the deficiency of equipment is one of the educational problems. Equipment is one of the basic factors for reaching educational targets. In order that a teacher could carry out his/her duty and devote himself/herself to the profession, equipment is the component that should be ready. If teachers face problems relating to equipment and the administrators cannot procure such equipment, we can conclude that their devotion will decrease as their motivation and moral will decrease accordingly.

More than half of the teachers referred to the indifference of both students and parents as one of the most important problems that they come across in their profession. Especially, changing socio-economic situations increase the indifference of students and parents. Parents put education on the back burner due to moral or financial situation. Children of those indifferent parents cannot concentrate on the courses and it stirs up troubles in school. The load of teachers will increase in such cases. It can be concluded that teachers will feel exhausted of dealing with both students and their parents, so their devotion will reduce.

Some of the teachers pointed out that their environment affects them. Recently, problems arise among teachers especially in schools. Devotion of teachers who are disturbed by the environment of the school will decrease. However, those teachers could focus on educational activities feeling comfortable if the environment is peaceful. It can be concluded that motivation of teachers will decrease as it will decrease their devotion to the profession in case that their environment is a negative one.

The analyses of themes and ratios emerging with the answers given by teachers were made in relation to the determination of the reasons of the impact of school executives behaviours to the teachers. Half of the teachers stated that they feel good in respect to the behaviours of administrators. We come across with leadership styles of school executives as one of the factors affecting the devotion of teachers to their profession. As a consequence, teachers who are comprehended by the school executives are respected and considered in making and putting into action the decisions in a democratic way by arranging meetings feel better. We can infer that devotion of teachers who feel good to their profession will increase.

A part of the teachers stated that they feel exhausted based on the leadership styles that the administrators have. Teachers who are working with rude, inconsiderate, unjust and not including teachers in making decisions, authoritative principals feel to be exhausted. Such exhaustion reduces devotion to the profession by reducing motivation. The fact that teachers who feel suffocated from educational activities work with a principal who does not have leadership quality will reduce their motivation and productivity. In case that devotion of teachers reduces, all components of learning and teaching process will suffer. There will problems in reaching the goals. More than half of the teachers stated that their motivation would increase in accordance with administrator's behaviours. Working with an administrator who meets the needs of teachers within the school and solves their problems will increase the motivation. Teachers who are highly motivated will adapt themselves more to their profession. It can be concluded that it will ease reaching the goals and running school affairs when the principals satisfy the demands of teachers by understanding them.

Some of the teachers pointed out that the principals show them negative attitudes according to their behaviours. We can conclude it is very natural that teachers whose needs and demands are not met by the principals within the school develop negative attitudes towards the school. It can be seen that teachers whose needs, views and demands are not satisfied by the principals within the school develop negative attitudes towards the school and reduce their devotion to the profession by disliking it.

It can be recommended to school principals to be patient, insightful and equal with regard to the determination of the feelings and thoughts about their management qualification. That school executives possess leadership characteristics is vital in reaching the targeted objectives. For this reason, school administrators can be recommended to act equally to all and not to be biased or take sides. In this context, the Ministry of Education can be suggested to supervise school executives and give in-service courses on leadership styles.

2. With regard to the determination of the reasons of choosing teaching profession, it can be said that teachers are informed about the profession before taking a start to work. It can be suggested to the Ministry of Education to organize seminars of introducing professions for the students for getting a profession. Because teacher who does not love the profession or have knowledge about the profession will not devote himself/herself to it.

3. In relation to the determination of the problems that teachers encounter, it can be observed that teachers dislike the profession. The ministry can be suggested to meet the needs of the school with additional budget for the insufficiency of equipment which is one of the main problems. The number of teachers and students could be distributed to each school equally by centralizing the schools. There can be a suggestion to cover the expense of economically poor children.

4. With regard to the determination of school executives' behaviours towards teachers, it can be recommended to detect the leadership styles of school executives and practical studies are conducted by specialists for the principals. The administrators who wear away teachers during educational activities, disincline them and diminish their devotion to the profession should be detected and warned. Finally, the Ministry of Education can be suggested to revise the criteria of hiring school executives.

REFERENCES

- Alıç, M. (1985). *'Okul Müdürlerinin Liderlik Davranışları ile Öğretmen Morali Arasındaki İlişkiler'* (Yayımlanmamış Doktora Tezi). Hacettepe Üniversitesi: Ankara.
- Armstrong, M. (2008). *Strategic Human Resource Management* (4th Edition). USA: Kogan Page Limited.
- Aydın, M. (2014). *Çağdaş Eğitim Denetimi*. Ankara: Gazi Kitabevi.
- Begeç, S. (1999). *Modern Liderlik Yaklaşımları ve Uygulamaları, Yüksek Lisans Tezi, Gebze Yüksek Teknoloji Enstitüsü, Mühendislik ve Fen Bilimleri Enstitüsü, Gebze*.
- Celep, C. (2000). *Eğitimde Örgütsel Adanma ve Öğretmenler*. Ankara: Anı Yayıncılık.
- Dalay, G. (2007). *'The Relationship Between the Variables of Organizational Trust, Job Engagement, Organizational Commitment and Job Involvement.'* (Yayımlanmamış Yüksek Lisans Tezi). Marmara Üniversitesi: İstanbul.
- Eren, E. (2008). *Örgütsel Davranış ve Yönetim Psikolojisi*, 11. Basım, Beta Basım Yayın: İstanbul.
- Eroğlu, S. (2007). *Toplam Kalite Yönetimi Uygulama:Ortaöğretim Kurumlarında Öğretmenlerin Örgütsel Adanmışlık Ve Motivasyon Düzeyleri*. (Yayımlanmamış Yüksek Lisans Tezi). Yeditepe Üniversitesi: İstanbul.
- Kanste, O. (2011). Work engagement work commitment and their association with well being the health care. *Scandinavian Journal of Caring Sciences*.(25,754076).
- Karagöz, L. (2008). *İlköğretim Öğretmenlerinin Görüşlerine Göre Örgütsel Adanma İle Örgütsel Yurttaşlık Davranışları Arasındaki İlişki*. (Yayımlanmamış Yüksek Lisans Tezi). Yeditepe Üniversitesi: İstanbul.
- Karahan, B. (2009). *Karizmatik Liderlik Özelliklerinin Örgütsel Bağlılık Unsurları Üzerindeki Etkileri ve Bir Araştırma* (Yayımlanmış Yüksek Lisans Tezi), Kocaeli Üniversitesi, Kocaeli.
- Stemler, S. (2001). *Özel ve resmi ilköğretim kurumlarının etkili okulun veliler boyutundaki özelliklerine sahip olma düzeyleri (Bursa ili örneği)*. (Yayımlanmış Yüksek Lisans Tezi). Uludağ Üniversitesi: Bursa.
- Şeşen, H. (2010). Kontrol aldığı, genel öz yeterlilik iş tatmini ve örgütsel adalet algısının örgütsel vatandaşlık algısına etkisi: Ankara'da bulunan kamu kurumlarında bir araştırma. *H.Ü. İktisadi ve İdari Bilimler Fakültesi Dergisi*, 28 (2), 195-220.
- Şimşek, A. (2006). *Duygusal Zekânın, Ana-Baba Tutumunun ve Doğum Sırasının Tercih Edilen Liderlik Tarzına Etkisi*, (Yayımlanmış Yüksek Lisans Tezi), Ankara Üniversitesi: Ankara.
- Şişman, M. (2012). *'Eğitimde mükemmellik arayışı: Etkili okullar'* (3. Baskı). Ankara: Pegem Yayıncılık.
- Türkan, M. (1999). *'Orta eğitim Öğretmenlerinin Beklenti ve Sorunları'*. (Yayımlanmış Yüksek Lisans Tezi). Dokuz Eylül Üniversitesi, İzmir.
- Türnüklü, A. (2000). Eğitimbilim araştırmalarında etkin olarak kullanılabilecek nitel bir araştırma tekniği:

- Yaman, E. (2010). Psikoşiddete (mobbinge) maruz kalan öğretim elemanlarının örgüt kültürü ve iklim algıları. *Kuram ve Uygulamada Eğitim Bilimleri*, 10 (1), 547-578.
- Yazıcıoğlu, Y. ve Erdoğan, S. (2004). *SPSS Uygulamalı bilimsel araştırma yöntemleri*. Ankara: Detay Yayıncılık.
- Yıldırım, A. ve Şimşek, H. (2008). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin Yayıncılık.
- Yıldırım, A. ve Şimşek, H. (2011). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin Yayıncılık.
- Yılmaz, E. (2005). Okullarda örgütsel güven ölçeğinin geçerlilik ve güvenirlik çalışması. *Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 14, 739.
- Zöğ, H. (2007). 'İstanbul İli Kağıthane İlçesinde Görev Yapan İlköğretim Okulu Öğretmenlerinin Örgütsel Adanmışlıkları ile İş Doyumları Arasındaki İlişki' (Yayımlanmamış Yüksek Lisans Tezi). Yıldız Teknik Üniversitesi: İstanbul

A Proposal Suggested for Mathematic Teachers' Professional Development in the Kingdom of Saudi Arabia based on STEM Education

Ali Taher Othman Ali

*College of education – King Saud University- Saudi Arabia
alitaher@ksu.edu.sa*

ABSTRACT

This research aims to suggest a proposal for mathematics teachers' professional development in relation to STEM education. To do so, the researcher used the analytical approach, and developed a questionnaire by extrapolating educational literatures, previous studies and relevant experiences to consult seventeen experts in mathematics education using Delphi method within three intervals. The researcher then suggested the proposal based on five main themes: educational system development, in-depth knowledge content improvement, pedagogical skills necessary for STEM teachers, professional development strategies related to STEM education, and assistance required for STEM professional development. In conclusion, the researcher highlighted several recommendations that should be considered when implementing professional development programs for mathematics teachers in the field of STEM.

Keywords: Professional development, mathematics teachers, the orientation of science, technology, engineering and mathematics (STEM).

INTRODUCTION

The Ministry of Education in the Kingdom of Saudi Arabia has placed a significant importance on teachers' professional development, in an effort to cope with education reform worldwide. National strategy initiatives for public education development took many forms in order to ensure the best qualitative shift in the performance of Saudi educational systems (King Abdullah Project for Public Education Development, 2010). One of the most notable efforts of the Ministry of Education is STEM initiative launched on 2010 within a package of national strategies for public education development. This kind of education is based on the integration between engineering, technology, science, and mathematics; as well as the elimination of barriers among these cognitive areas. It also aims to find creative optimal solutions for real problems, and to develop students' on going learning abilities; encouraging them to create and innovate. The role of engineering is highlighted by the importance and effectiveness of finding several solutions with high, global efficiency; developing thereof critical thinking skills necessary for the modern life (Kennedy & Odell, 2014).

The Ministry seeks through STEM initiative to develop public education by enhancing students' understanding and acquisition of research and scientific skills; as well as increasing their achievement levels. The Ministry also spares no effort to improve teachers' competencies of effective teaching and expand opportunities of applying knowledge, and mathematical, scientific skills. The above-mentioned initiative concentrates on teachers' professional development through building global partnerships with pioneering universities and organizations in science and mathematics education, establishing scientific centers, and developing the digital content supporting teaching and learning process (Ministry of Education, 2010).

STUDY REVIEW

Several modern researches, literatures and studies highlight the importance of teachers' development in Saudi Arabia in light of STEM education; one of which is a study conducted by Aldossari (2015) "Diagnosing STEM Education in Saudi Arabia in Light of International Experiences" which recommended to establish pre- and in-service training programs to train mathematics and science teachers on STEM education. Moreover, the 1st Excellence Conference in Teaching and Learning of Science and Mathematics: STEM (King Saudi University, 2015) shed the light on the importance of conducting further researches on Saudi teachers' practices and performance, and developing various programs necessary for enhancing STEM teaching in public education in the Kingdom by improving teachers' capabilities.

Accordingly, this study provides a proposal for mathematic teachers' professional development in the Kingdom of Saudi Arabia based on STEM education as a new modern approach in mathematics education.

QUESTION OF THE STUDY

What is the proposal suggested for mathematic teachers' professional development in the Kingdom of Saudi Arabia based on STEM education?

IMPORTANCE OF THE STUDY

The proposal suggested in this study plays a key role in assisting education policy makers to design programs for mathematics teachers' professional development in accordance with STEM approach. It also helps colleges of education in Saudi universities to develop teachers' training programs based on that approach. Moreover, the proposal can guide educational supervisors to design in-service mathematics teachers' performance and encourage those teachers to develop themselves.

STUDY LIMITATIONS

The study was restricted to providing a proposal for mathematic teachers' professional development in the Kingdom of Saudi Arabia based on STEM education from the prospective of seventeen experts in mathematics education during the first and second semesters 2015/2016.

STUDY TERMINOLOGIES

STEM Approach: it is the abbreviation of four cognitive learning areas: science, technology, engineering, and mathematics. These areas are integrated in the learning and teaching process through creating a learning environment that can help learners to listen and involve in educational workshops and projects; making them able to develop their skills and knowledge to comprehensively, coherently, easily and enjoyably understand the various sciences.

STUDY METHODOLOGY

The study used the analytical descriptive methodology through reviewing international researches, literatures, and experiences relevant to STEM approach. The proposal was formed based on the following:

- Reviewing STEM education's researches and studies.
- Investigating the reality of mathematics teachers' professional development concerning STEM education in Saudi Arabia.
- Reviewing international experiences in STEM education particularly with regard to STEM training programs for teachers in the United States and United Kingdom.

Accordingly, the initial proposal was established and a questionnaire was developed to receive feedback from seventeen experts in mathematics education using Delphi method via three intervals.

STUDY RESULTS

After these intervals, the study suggested the following proposal based on five main themes; each one is linked with several sub-requirements:

The first theme: "Educational System Development"	
1	Developing educational systems to meet STEM requirements
2	Allocating enough budget to support and meet STEM requirements
3	Identifying professional development programs, times, and regulations of FTE for candidate teachers
4	Identifying incentives mechanisms and promotion systems for teachers enrolling to STEM programs
The second theme: "The Concentration of STEM Deep Cognitive Content"	
1	Realizing teachers' abilities and motivations to fully understand STEM concepts
2	Identifying components necessary for development through various experiences related to real-world problems relevant to STEM education
3	Emphasizing on building current teachers' capabilities in STEM by designing developmental programs based on appropriate contexts
4	Developing specialized materials in STEM for teachers such as digital simulations and videos
5	Providing teachers with all resources concerning STEM education
6	Publishing researches, and studies supporting STEM education
The third theme: "Educational Skills Necessary for STEM Professional Development"	
1	Developing teachers' accurate understanding of STEM education
2	Recognizing students' misconceptions regarding STEM, and identifying correctional methods by teachers
3	Encouraging students to research, design experiences, and process data in STEM education
4	Recognizing the optimal way to increase students' enthusiasm toward learning STEM topics

The fourth theme: “STEM Professional Development Strategies”	
1	Using various strategies to enable teachers to design and transfer experiences that reflect their scientific understanding of STEM
2	Improving teachers’ teaching methods through ongoing discussions about STEM issues
3	Enabling teachers to use various tools of self-reflection such as peer coaching and portfolios
4	Encouraging the exchange of experiences among teachers through supervisors, trainers, and outstanding teachers to provide STEM professional development opportunities
5	Benefiting from high performance teachers to serve as STEM resources
6	Enhancing the use of technology to create direct and virtual learning communities for exchanging best practices
7	Providing learning opportunities and developing procedural research skills to create new STEM knowledge
The fifth theme: “Support and Assistance toward STEM Professional Development”	
1	Providing clear opportunities appropriate for teachers’ professional development within one school’s context
2	Creating appropriate affective STEM teaching environment inside and outside schools
3	Establishing partnerships between Ministry of education and local and international institutions to develop STEM professional development

COMMENT ON RESULTS

From the previous table, results highlighted five main themes; each one has been linked with several sub-requirements by the seventeen experts in mathematics education. These main themes and their sub-requirements represent the proposal for professional development of mathematics teachers in The Kingdom of Saudi Arabia according to the approach of science, technology, engineering and mathematics (STEM).

Table (5) shows that there is agreement among mathematics education experts on the five main themes: The first: “Educational System Development”, The second: “The Concentration of STEM Deep Cognitive Content”, The third: “Educational Skills Necessary for STEM Professional Development”, The fourth: “STEM Professional Development Strategies”, The fifth: “Support and Assistance toward STEM Professional Development”, and their sub-requirements, with some differences in the arithmetic mean.

The results of the study are consistent with the results of previous studies such as the study of Moheisen and Khaja (2015). In addition, these results align with the American experience in STEM education.

The researcher believes here that the proposed vision of this study needs to change the culture of Saudi schools, which may in return require a long period of time.

RECOMMENDATIONS

- Developing training programs for teachers in Saudi universities to meet STEM requirements and establishing new standards to ensure high quality of these programs in light of STEM education.
- Designing training programs for mathematic teachers in accordance with STEM education.
- Benefiting from partnerships between Ministry of Education and institutions of local and international society in concluding agreements to develop teacher’s STEM abilities.
- Designing the curriculum to consist with STEM approach.

REFERENCES

- Al-Muhsin, Ibrahim, Khajja, brilliant (2015). Professional development of science teachers in the light of the integration of science, technology, engineering and mathematics STEM, Conference of Excellence in Education and Learning of Science and Mathematics: Science, Mathematics, Technology and Engineering (STEM), held at King Saud University, 5-7 / 5/2015, P 13-38.
- Dossary, Hind (2015). The reality of the Saudi experience in teaching STEM in the light of international experiences. Conference of Excellence in Teaching and Learning Science and Mathematics: Science, Mathematics, Technology and Engineering (STEM) held at King Saud University during the period 5-7 / 5/2015, P 101-153.
- Honey, Margaret; Pearson, Greg; and Schweingruber, Heidi (2014). STEM Integration in K-12 Education: Status, Prospects, and an Agenda for Research. Committee on Integrated STEM Education; National Academy of Engineering; National Research Council: <http://www.chitech.org>
- Kennedy, T. J., & Odell, M. R. L. (2014). Engaging Students In STEM Education. Science Education International, 25(3), 246–258.

- Kennedy, T. J., & Odell, M. R. L. (2014). Engaging Students In STEM Education. *Science Education International*, 25(3), 246–258.
- King Abdullah Education Development Project (2010). Draft national strategy for the development of public education. Tatweer for Educational Services. Kingdom of Saudi Arabia.
- Ministry of Education in Saudi Arabia (2010). Draft national strategy for the development of public education. Kingdom of Saudi Arabia.
- William E. Dugger, Jr. (2013). Evolution of STEM in the United States. International Technology and Engineering Educators Association.