

# THE TURKISH ONLINE JOURNAL OF EDUCATIONAL TECHNOLOGY

# December, 2017

**Special Issue for ITEC 2017** 

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ISSN: 2146 - 7242

Indexed by Education Resources Information Center – ERIC SCOPUS - ELSEVIER



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Published in TURKEY

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## Message from the Editor-in-Chief

#### Dear Colleagues,

We are very pleased to publish Special Issue for ITEC-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 The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJET.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.

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## A Framework for Managing Complexity in Higher Education

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#### ABSTRACT

This theoretical paper depicts the changes in the context of higher education with the help of complexity theory and the Cynefin framework. The framework is developed with the intention to offer perspectives to explore complex systems in knowledge work characterized by uncertainty and lack of cause-effect relationships. There is an ambitions national project in Finland aiming at changing the work life in Finland the best in Europe by 2020, because work life in Finland has encountered many reforms lately, and these changes have increased the demand level of work, which in turn requires changes from higher education and its outcomes.

#### INTRODUCTION

There is a national project (Työelämä 2020, 2013) in Finland aiming at making Finland the most educated nation by year 2020. The program also aims at improving the quality of work life in Finland - to make it the best in Europe by year 2020. At the same time, the country has encountered a long financial recession where the state budget money spent in education has been cut. Improving the quality of education and work life at the same time as cutting the financing of education has put the institutions of higher education in a difficult – if not impossible – situation. In sum, higher education institutions are required to produce more results and better results with less money. This paper discusses the challenges the universities of applied sciences have faced in this complex situation denounced by conflicting requirements, and the paper also suggests a theoretical framework to help in sense making of the situation.

The Finnish higher education systems consists of first cycle university degree (bachelor's degree), the second cycle university degree (master's degree) and postgraduate studies (third cycle) that lead to a licentiate or a doctoral degree. The universities offer all three cycles. The universities of applied sciences offer either bachelor's degrees consisting of 3.5-4.5 years of full-time study including a mandatory period of practical training and master's degrees requiring 1-2 years of part-time study. In addition to educational tasks, the universities of applied sciences have an important position in regional development in terms of research, development and innovation.

The higher education sector is going through changes concerning both their financing and their administration. This has required a change in legislation. The first phase of renewals started in the beginning of 2014 concerning the change in the financing model. The financing of universities of applied sciences used to come from municipalities, but in the new financing model, it comes from the state budget. Due to these changes, the universities of applied sciences lost one fifth of their financing between years 2012-2015. The new financing model is based mainly on the amount of degrees produced and on the pace of proceeding of studies. 85% of money comes based on outcomes in education and the rest 15 % from outcomes in research and development activities. (Salminen, 2013.) From the beginning of year 2015, all universities of applied sciences have operated as corporations under public law. Operations as an independent legal person are supposed to give the universities of applied sciences a more independent status and more flexibility. This has also implications to the leadership model and decision-making of the schools. However, despite the corporal structure, the universities of applied sciences operate as non-profit organizations.

The evaluation criteria for universities of applied sciences are the quality, effectiveness, efficiency and the economic soundness of operations. To fulfill the targets the universities of applied sciences among other institutions of higher education have been urged to lengthen the work careers by cutting the time spent in higher education studies and by introducing new learning environments, new ways of learning and new ways of teaching. Alasoini (2011) states that it has been recognized on national level that developing the quality of work life conditions and productivity support each other.



Differences in the production level are created mostly inside working communities by the way that work is done. Recognizing this change requires renovation and innovation. There is a guest for new practices in working, new kinds or work life skills and ability to utilize the possibilities offered by (digital) technology to enhance the quality and effectiveness of teaching and research and development in universities of applied sciences.

Traditional management research considers organizations as machine-like mechanisms that can be controlled (Morgan, 1996). It is common for traditional management theories to assume that organizations need some kind of hierarchical management. Indeed, these kinds of management models function well in the context of physical production, for instance. However, they seem to be ill suited in knowledge-oriented economy like educational institutions. (Uhl-Bien et al., 2007.) The change of paradigm from traditional management towards complexity theory in defining the context of organizations has changed the ways of working and organizing. Redefining organizational practices means moving away from mass production efficiencies, hierarchical organization and central control and introducing flexible, learning organizations that constantly change and solve problems through interconnected, self-organizing processes. (Daft & Lewin, 1993.)

## SHORT INTRODUCTION TO COMPLEXITY THEORY

Complexity theory grew out of systems theory in 1960's. Complexity theory – including the concepts of chaos, emergence and self-organization – has been considered one of the most revolutionary products of the 20<sup>th</sup> century having influence on science, technology, economics, finance and social sciences among others. Complexity theory suggests that organizations tend to self-organize themselves to a state where they regulate themselves. Any complex systems, such as organisms, societies or the Internet, have emergent properties that cannot be reduced to the mere properties of their parts. The behaviour of these systems is unpredictable and uncontrollable, and it cannot be described in any complete manner. (Heylighen, 2009.)

Complexity theory posits that systems begin as collections of individual actors who organize themselves and create relationships that form in response to positive or negative feedback. New structures and behaviours then emerge as the actors act and react to each other – creating value because of individual interactions. The emergent result is often more than, or qualitatively different from, the sum of individual actions. (Haffeld, 2012.) Feedback loops serve as the driver for the evolution of the system. Positive feedback moves individual actors or groups of actors closer to a goal perceived to be important while negative feedback suppresses change and drive the system towards equilibrium. (Mason, 2008). This kind of non-mechanistic approach and resistance to reductionism made a worldview different from the traditional scientific approach. By the 1980s, researchers at the Santa Fe Institute attempted to unify some of these core concepts into a model known as a complex adaptive system (CAS). While this model shares commonality with elements of all the preceding theories, the nature of complex adaptive systems is an entity itself and still an evolving construct. (Alhadeff-Jones, 2008.)

#### **CYNEFIN FRAMEWORK**

Kurtz and Snowden (2003) and later Snowden and Boone (2007) developed the Cynefin framework as a sensemaking tool for strategic decision making in business problems and situations. The conceptual thinking draws from knowledge management and complexity science. The framework challenges the assumptions of order, rational choice and intent (Massy, 2005). The Cynefin framework offers a perspective of complex systems characterized with uncertainty. The framework is based on the idea that many problems in management are caused by the mismatch of management style and organizational environment. The objective of the framework is to reach consensus to reduce the unknown domain. (Ahmed et al., 2014.)

The Cynefin framework is described in figure 1. The quadrants represent types of situations that organizations typically face and need to manage. The ordered domains are called simple and complicated; the unordered domains are called complex and chaos. The fifth are is the domain of disorder. Unorder does not mean lack of order in the model, but instead it describes emergent order. The Cynefin framework is not a categorization framework that implies that the most desirable situation is in the upper right corner. On the contrary, none of the domains is better than the others. (Kurtz & Snowden, 2003.)



#### Figure 1: The Cynefin framework



Different contexts in the Cynefin framework are described as follows by Kurtz and Snowden (2003) and Snowden and Boone (2007) as follows:

- 1. A simple context is the realm of known where the cause and effect relationship is known and repeatable and where it is possible to determine, based on facts, a correct action or right answer for each situation in advance. Repeatability allows the use of predictive models and it is possible to operate based on routines and standard operating procedures. A simple context represents the domain of best practice that are derived from past experience.
- 2. A complicated context is the realm of known unknowns. It is also predictable but more varied because the cause and effect are separated over time and space. However, it is possible to move from this domain to the simple domain if only enough time and resources can be used. There are clear relationships with multiple answers but all these challenges can be tackled using analysis, scenario planning and systems thinking. It requires expertise and communication between experts. This is the domain of learning organization and good practice.
- 3. A complex context is the realm of unknown unknowns and the domain of emergent practice. It is the domain of complexity theory. Complex is something that situates between order and disorder exhibiting predictability in some and unpredictability in other aspects at once. Complexity theory studies how patterns emerge through the interaction of many agents. A complex context is one where the cause and effect relationships are not known and where there is no predictability. This is why categorization or analytic techniques are not available. Information is unstructured and related but people do not know how. Taking decisions cannot be based on knowledge or analytical approach but instead, the actions are based on emerging patterns, experimentation and increased interaction. The management is based on facilitating because this space requires multiple perspectives. It is possible to evaluate the adequacy of actions only in retrospective because emerging patterns are such that they can be perceived but not predicted.
- 4. A chaotic context is more turbulent, complicated, surprising and challenging than a complex context. The cause and effect relationships cannot be defined. Every piece of information is a fragment with no relationship to any other. Applying best practice is what probably what precipitated chaos and there is nothing to analyse nor will patterns emerge. In a chaotic context people need strong contention, authoritarian intervention and crisis management to reduce the turbulence. Novel practice and innovations come to the force in a chaotic context and it is possible to enter this domain on purpose in order to open up new possibilities.
- 5. Disorder is a context where an organization ends up from any of the above-mentioned contexts when it is unable to recognize its context. It is a domain to understand conflict among decision makers looking at the same situation from different points of view. In this kind of situation people tend to pull it towards the domain they feel the most comfortable. That is why it becomes important to reduce the size of the disorder domain and to achieve consensus among decision makers both on the situation and on the most appropriate response.

#### MANAGING IN COMPLEX CONTEXT

The Cynefin framework provides pointers on how to study complex systems (der Walt & de Wet, 2008). It can be utilized for contextualization. Most decision-making situations in organizations take place in a complex context. In this kind of context management practices include, among others, the improvement of communication, the promotion of new ideas, tolerance for difference and the constant observation of the organizational context. (Snowden & Boone, 2007.)



Indeed, it is as interesting to investigate the possibilities concerning moving between the different domains of the Cynefin framework as to think of the present domain because a move across boundaries requires a shift to different way of understanding and interpretation – and thus a different leadership style. The simple and complicated domains are the domains of order where the most important boundary for sense making is what can be used immediately because it is known and what needs time and energy to be found out but is knowable at the end. In the complex and chaotic domains, knowability is less important but interaction is important – that is, what we can pattern in complex domain and what needs to be stabilized for patterns to emerge in chaotic domain. (Kurtz & Snowden, 2003.)

The order domain, i.e. the simple and complicated ones, represent an area where the connections between managers and staff are strong. There are structures that control behaviour like procedures and forms. On the other hand, the disorder domains, i.e. the complex and chaos, are such that the connections between managers and staff are week and control through structure usually fails. In complex and complicated domains, connections between staff are strong and stable group patterns can emerge. In simple and chaotic domains, connections between staff are weak and emergent patterns do not form on their own. (Kurtz & Snowden, 2003.)

The simple domain is characterized by a clear relationship between cause and effect. The decision model in this domain is to sense the situation, categorize it and respond. The response is based on best practice. The complicated domain is also characterized by cause and effect but there may be multiple right answers. The decision model is to sense, analyse and respond. This requires expert work and the response is based on good practice. The complex domain is unpredictable in a way that cause and effect can only be understood in retrospect. Answers are found by experimentation and the decision model is to probe, sense and respond. This way practice emerges. (Kurtz & Snowden, 2003.)

The domain of chaos is such that there is no link between cause and effect nor are there any right answers. The decision model is to act, sense and respond as, for example, in crisis management. Crises often occur when weak signals have been omitted and there has been an unrecognized context change in the simple domain. It is a situation where best practice ceases to work and the system collapses catastrophically into chaos. In that kind of situation there are two different approaches: either the decisive, directive management control to re-establish the good practices, i.e. forcing the organization to move from chaos back to the simple domain, either to look for small patterns in the chaos that show the type of practice the organization wants to have. Managers can thus support these beneficial patterns and try to replicate them throughout the organization. This is a way to move from chaos to the complex and then the complicated domains. However, neither of these approaches automatically guarantees success. Finally, the domain of disorder is one where the domain cannot be defined or decided. (Kurtz & Snowden, 2003).

In a complex environment, the employees have to make an effort to collaborate. Thus, flatter hierarchies, decentralization of decision-making, self-organization, emergence, the empowerment of employees and the creation of new order are key characteristics of complex systems (Daft & Lewin, 1993; Mitleton-Kelly, 2003). In the case of a complex or occasionally even chaotic environment (Kurtz & Snowden 2003), which are typical for knowledge work (Donnelly, 2006) there is a need for other kinds of ways of working and ways of managing. The probe, sense and respond model becomes useful for the management (Kurtz & Snowden, 2003).

#### IMPLICATIONS FOR HIGHER EDUCATION INSTITUTIONS

Educational governance usually tends to be complex rather than complicated and its solutions are not necessarily replicable and transferable (Snyder, 2013). However, educational initiatives often attempt to dwell in the realm of the complicated when in fact they are operating in the realm of the complex (Duit et al., 2010). This means that problems are often solved by experts launching a solution they believe is whole, complete, widely replicable and easily actionable. However, complex problems cannot be captured with such linear approaches. (Morrison, 2010; Duit et al., 2010.)

Educational governance thus requires an approach that allows for changing initial conditions, the emergence of non-mechanistic phenomena and flexibility. Above all, it must allow for the fact that reductionism will not work – there will be no single right answer, no single approach that holds the key to successful implementation. Flexibility and feedback are necessary to manage successfully in a complex system, but doing so requires a fundamental reframing of the way we look at common problems in educational governance. Policies must move from one-size fits all solutions to iterative processes derived from constant feedback between all stakeholders and the barriers between design and implementation should be collapsed. The whole undertake becomes process-driven rather than outcome-driven. This requires strong leadership at all levels, and focusing on the complex interactions of the actors within educational systems, creating a broader view of educational systems as holistic organisms. It will also require an approach that allows key issues to be identified within complex systems so that the nature of educational systems does not lead to systemic paralysis and to the temptation of oversimplification. Viewing governance issues in isolation and seeking reductionist approaches targeting specific policy areas or pedagogical changes is unlikely to yield positive, sustainable change on a large scale. To be effective in a complex realm requires a fuller understanding of complexity itself. (Snyder, 2013.)

As the complexity of context increases, organizations must increase their own complexity to correspond the complexity level of their environment, because it takes complexity to defeat complexity (Uhl-Bien et al., 2007). Organizations in complex environments have consciously given up pursuing order and control and this is reflected in the ways of working and managing. They are operating at the "edge of chaos", which is the balance necessary for adaptation and self-organization to occur. There are a number of positive features, such as flexibility, autonomy and robustness, that traditional mechanistic organizations lack. The positive qualities are aspects of the process of self-organization, where order is created out of disorder. These kinds of systems organize themselves to the state where they want to be and where they regulate themselves as to better cope with internal and external conflicts and this allows them to adapt to a constantly changing environment. (Heylighen, 2009).

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## A Proposal Suggested for Mathematic Teachers' Professional Development in the Kingdome of Saudi Arabia based on STEM Education

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#### 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, 1431AH). 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 Arabi in Light of International Experiences" which recommended to establish pre-and inservice training programs to train mathematics and science teachers on STEM education. Moreover, the 1<sup>st</sup> 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 Kingdome 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 Kingdome 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 Kingdome 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. 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	

#### **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.

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## Action Research as a Tool to Inform Pre-Service Instruction

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#### ABSTRACT

Authors investigate ways teacher education programs utilize data to prepare teachers. Authors use knowledge from graduate-level action research projects to drive change in an undergraduate pre-service teacher-training program. Authors argue that action research can be a catalyst for a better design of instruction and classroom dynamics on across educational levels.

Key words: Action research, pre-service teacher education, classroom teaching

Action research is teacher engagement in inquiry, the type of inquiry that enables practitioners to take action and then act upon the results (Dana, 2013). Dana points out that, historically, the action research process asks teachers to reflect upon individual learners, curriculum, pedagogy, student learning styles, and/or classroom structure with the goal of gathering information that will enable a teacher to:

- develop reflective practice
- effect positive changes in the school environment
- alter long standing educational practices
- create a classroom environment that is qualitatively different from environments that exist in test-driven classrooms.

At the same time, it is also important that we, in our role as teacher educators, provide

opportunities for our students to become change agents, decision makers, consultants, curriculum developers, activists, and school leaders while they are in the classroom (Cochran-Smith & Lytle, 1999). This, we suggest, can be done through the introduction of action research. Current emphasis on reflective teaching practices makes action research easy to use, primarily because the action research process itself enhances one's own quest for improvement (Neapolitan, 2000). Action research is not imposed upon teachers by someone else, but is a self-directed process (Mills, 2011); therefore, it allows the practitioner to express his/her own unique identity as a teacher (Dana, 2013).

As an action researcher, one reflects upon the results of the data collected. While this is paramount to improving teaching and learning in the PreK-12 classroom, understanding the results of action research can also help higher education faculty as they prepare teacher educators and consider the structure of their teacher education programs. Ironically, some of these educational training programs are criticized as inadequately addressing issues that occur in the field (Brydon-Miller, Greenwood, & Maguire, 2003). This omission in relevancy might possibly be attributed to the fact that teacher education faculty no longer participate in the daily activities of PreK-12 classrooms.

Consequently, we have decided to fill that void through our graduate student action research projects. We, as faculty in a university education program, use conclusions from the projects of the graduate students that we oversee to inform our own teaching of undergraduate students enrolled in our teacher preparation program.

In our graduate action research courses, we require students to analyze the data collected. But once the data are analyzed and interpreted, our students need to discuss the implications of these data. This information enables us to demonstrate to our pre-service teachers how collecting data results in change. For a classroom teacher, action research can serve as a tool to understand what works and what does not work in a given classroom for a given set of students. At the same time, action research that concerns itself with school-wide issues can lead to change on a school-wide level. For higher education professionals, working with practicing teachers in graduate level programs, this new information can be a window through which to view current teaching trends. This new knowledge can then inform college level pre-service educators as to what is important as we train future PreK-12 teachers. It is from this perspective that we address action research in the current paper.

#### METHOD

#### Sources of Data

The data analyzed in this work comes from four cases that the authors examined following the teaching of a yearlong Educational Research course for masters students in a small private university in the Northeast. The students in the course were practicing teachers who had completed their course of graduate study and were in the last, capstone style course. The goal of the research course was to have each student develop and execute an action research study in their respective classrooms. As instructors, we allowed students to explore their area of interest, coached students through the literature review process, and helped students design the study. Students then collected data for 6-10 weeks, spent time analyzing the data, and ultimately, wrote their final reports.

The four cases presented in this paper are illustrations of how each action research project gives insights to the higher education faculty who teach pre-service education students with regards to current PreK-12 classrooms.

#### Case 1

*Setting.* An example of an action research project that influenced learning was a study about student reactions to authentic assignments versus traditional textbook assignments. The study occurred in a ninth grade Algebra I class. For part of the week, the concept was introduced and students completed textbook generated exercises. For the latter part of the week, students had an authentic assignment such as analyzing the correlation between the hours of sleep a student received and his/her last algebra test to understand the topic of scatterplots and lines of best fit. This process occurred over a 4-week period with each week having different authentic assignments.

*Findings.* Results revealed that students found these authentic assignments to be more challenging than traditional textbook exercises and they felt they understood the concept better because of them. Students also commented that they were more focused and motivated when completing authentic assignments. However, some preferred the traditional assignments because they were more straightforward and simple, although they did believe that the authentic assignments were more useful and applicable to the real world. Observational results also indicted that students remained more on task during the authentic assignments than during the traditional activities. Yet, some students astudents astudents astudents were often in that tradition.

*Implications for Higher Education faculty.* As teacher education faculty, much learning was derived from this study that we have adapted into the pre-service teacher preparation courses. One, while we often discuss authentic assignments, we also began to model and discuss what an authentic assessment may look like, ways it should align with the objective, and the integration with traditional activities. Next, we incorporated discussions about creating challenging assignments and comparing those with ones that are too challenging and beyond student ability with those that do not challenge enough. This led to activities and discussions about the validity of student complaints regarding too much work and their abilities at varying ages. Also, time management which is often addressed in a



teacher education program, was now viewed with a different perspective. The task analysis of the skills needed to complete authentic assignments prompted students to realize that more time was needed on the given topic. Preservice teachers needed to understand that spending more time on the authentic activities would affect the instruction of other topics that would need to be shortened or omitted to complete the unit of study. Finally, through this process we have realized that more time is needed in analyzing assignment and assessment results to determine common misunderstandings and ways to adjust subsequent lessons.

#### Case 2

Setting. This case was a single subject study that involved a 4-year old, male, pre-school student diagnosed with Autism Spectrum Disorder (ASD). The child under study exhibited serious deficits in social skills development and, as a result, displayed negative behavior in school playgroups as well as at home with siblings. The teacher, a graduate student in this case, felt that it was the role of the special education teacher to teach these social skills to the student as he "began his educational journey." In order to help revamp the student's limited social skills, the teacher created a social story intervention. That intervention included the reading of a social story on a daily basis, the discussion of a comprehension checklist and a modeled play scenario that occurred between the student and the teacher. The social story had been created and illustrated by the teacher specifically for that student. This tailor-made story used the student's name on each page, pointed out the positive social interactions performed by the student, and finally incorporated colorful illustrations on each page that displayed items of personal importance to the student under study. The teacher-researcher used comprehension checks, field notes, and partial interval record forms in order to measure growth in the student's behavior and social interaction.

*Findings.* The results of this 5-week study indicated that applying a social story intervention on a daily basis can effectively improve a preschool ASD student's social skills both in school and at home and provide that student with an opportunity to be socially successful during structured and unstructured dramatic play time.

*Implications for Higher Education Faculty.* I was able to share the findings of this study with my undergraduate students. This particular intervention garnered a great deal of discussion. Further, I was able to point out that this type of individualized approach to specific social problems, along with the creation of a colorful personalized storybook illustrating acceptable behaviors read on a daily basis, can have a positive impact on the behavior of students with limited social skills. Finally, this particular study allowed all of us to think in terms of the overall need to infuse more information about strategies and interventions into our undergraduate education courses. These special education strategies can be used by all PreK-6 teachers within the classroom for any student who may have limited social skills.

#### Case 3

*Setting.* The case was a school-wide study. Working in a diverse school district with a large English as a Second Language (ESL) student population, the teacher-researcher was interested in understanding how peer tutoring affects vocabulary development, namely recognition, of low SES bilingual and monolingual students in second grade. The teacher also noticed that bilingual and monolingual children tended not to interact across groups. The teacher wanted to examine if peer tutoring helped boost the across-group interactions.

To study these issues, the teacher solicited help from her colleagues and her administration. She set up a class with peer tutoring groups. In each peer group there was one ESL student and one monolingual student. She also had classes where there were no peer groups. One such class had only students who spoke Spanish and were learning English at school in the ESL program, and one such class had only monolingual English speaking students. No peer groups or buddy system were used in these two classes, and the instruction was traditional teacher-directed learning in these two classes. In the peer tutoring class, students also had traditional instruction but with one key difference. Students met with their peer buddy four times each week for 30-minute sessions to work on the recognition of the vocabulary sight words and the words from the *Cat in the Hat*, a famous children's book by Dr. Seuss. The teacher



also spent time observing children during lunch and recess to note any changes in social interactions. The study lasted 6 weeks.

**Findings.** The results of the study indicated that the children in all three groups improved; however, ESL students who worked with English speaking buddies showed an almost 53% improvement in the growth of their vocabulary, whereas the ESL students who did not work in peer groups showed 36.83% improvement. Monolingual students who were in a buddy system classroom also outpaced their monolingual counterparts who did not engage in peer tutoring in the growth of their vocabulary. Both monolinguals and bilinguals who were a part of the peer buddy classroom had a higher increase in the number of words they correctly read per minute than did the students who did not have a buddy to work with in either of the two classrooms. In general, students who worked with a buddy for 6 weeks seemed more motivated and happy to work with their partners. In addition to the increased academic achievement, the results of the study indicated that both monolingual and ESL students who had a buddy to work with also spent more time together on the playground and seemed to overcome the barrier of feeling they belonged to only one group.

When the teacher-researcher shared her findings with her fellow teachers and administrators, the discussion about the ability to help ESL students succeed on many different levels ensued. That discussion led to the school-wide change, where the entire elementary school embraced the buddy system.

*Implications for Higher Education faculty.* The purpose of the study was to investigate the vocabulary recognition during the buddy system tutoring sessions and to understand whether social interactions between the two groups of children can be improved. Higher Education faculty can utilize these findings in their undergraduate classes in many different ways. FIrst, the results of the study affirmed to us that the innovations teachers use in their classrooms matter. Talking to undergraduate students about the fact that these innovations do not need to have classroom boundaries but can and should be open to all teachers in the grade or even a school level is important. It allows preservice teachers to see the big picture and to understand the types of interactions that are possible.

Evident from the study is that structured social interactions benefit all learners. Higher Education faculty can spend time speaking with the undergraduate students about the fact that pairing of the students was thoughtfully constructed by the teacher based on numerous factors. That means that the teacher in the study had to take the time to know each student and to make sure that the pairing takes into account not only the language skills but also interests, prior knowledge, and experiences. This type of structural interaction is important not only socially, but academically. To be successful, however, the buddy system has to be sustained over a period of time. To ensure the sustained implementation of the system, the teacher had to think about the big picture, namely how the buddy system was set up, the types of supervision and checks that needed to be built in to ensure the seamless work of the tutoring pairs, the preparation of materials, and many other things that ensure the success of a program. Discussing these issues allows us, as faculty, to talk to undergraduate students about the importance of organization, self-discipline, preparation, and teamwork on the part of the teacher.

Working with the graduate student on understanding what works and what does not work in her school and how what works can be used in the daily school activities, helped us as teachers understand the information our undergraduate students need to know about the daily workings of an elementary teacher classrooms with a bilingual population.

#### Case 4

*Setting.* This particular action research study was conducted in an eighth grade language arts class; however the results of this study can be applied to both middle and high school levels.

*Findings*. The teacher-researcher in this case decided that she wanted to address and improve reasoned, logical argument skills in the writing of eighth grade students. The newly instituted Common Core requirements (Standard #1) were at the heart of this study and informed the intervention that she chose to apply. That particular standard reads:

- 1. Students will be able to write arguments to support claims with clear reasons and relevant evidence:
- a. introduce claims, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
- b. support claims with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
- c. use words, phrase, and clauses to create cohesion and clarify the relationships among claims, counterclaims, reason, and evidence.
- d. provide a concluding statement or section that follows from and supports the argument.

The teacher-researcher implemented instruction in critical questioning strategies and used the seven-part Toulmin model of argument as the intervention in order to assist and direct the writing of students under study as they: a) made claims; b) acknowledged claims and distinguished them from opposing claims: c) supported claims with logical reasoning, and d) clarified relationships between claims. The research objective was to have students develop the requisite skills that would lead to logical, reasoned arguments based on analysis of data. Over a 6-week period, students read a number of text in a variety of genres and developed written arguments in response to their readings. Data were collected through pre- and posttest writing scores as well as through a student attitudinal survey. The results of this study indicated that critical question strategies, in conjunction with the Toulmin model, can effectively improve the quality of student argumentative writing.

*Implications for Higher Education Faculty.* For the members of the teacher education faculty, this was a highly informative action research project. Preliminarily, it reminded us of the fact that the Common Core standards were now stressing argumentative writing and for those who were teaching language arts at either the middle school or high school this was a standard that needed to be considered and addressed. Middle school and high school students would be tested on this skill and it was important that our pre-service teachers (6-12) became aware of that reality. We, as a faculty, further realized that we needed to teach our pre-service teachers the importance of exposing middle school and high school students to the art of taking a position and backing that position up with logical, reasoned data. For those of us who taught writing classes at the graduate level, the results of this action research were extremely helpful. We, as writing instructors, now became familiar with a very prescriptive, but successful and easy-to-follow model (Toulmin) that we could introduce to our pre-service students. Moreover, the design, as well as the results of this action research reminded me, in particular, of the importance of encouraging critical thinking on the part of students in each of my pre-service classes. Requiring our pre-service teachers to think critically exposes them to the types of questions and strategies that foster the logical and reasoned thought we wish to have students incorporate into their required writing.

#### DISCUSSION AND CONCLUSION

Based upon gathering and analyzing student data, action research empowers the teacher to take action and address learning differences (Ornstein, Pajak, & Ornstein, 2015) while simultaneously improving student learning and teacher pedagogy (Arends, 2007). Likewise, it does so for Higher Education faculty. Based on the four cases, the following pedagogical implications for pre-service teacher educators can be discerned:

- Modeling authentic activities and assessment while also ensuring their alignment with objectives is an important tool for Higher Education pre-service teacher faculty have to explicitly teach.
- Students in pre-service teacher education programs must understand that making curricular adjustment to provide adequate time for authentic activities and assessments may be necessary to make these activities meaningful.
- Pre-service teachers should have explicit discussions to understand that authentic activities require teachers to have high expectations for students.
- Pre-service teacher educators must also understand that they must continuously challenge students by providing appropriate scaffolding.
- Pre-service teachers need to be cognizant of the idea that in some instances the approach, whether social or academic, needs to be individualized. This needs to be practiced in field placements and discussed across multiple situations and courses.



- In order for individualized approaches to be successful, the teacher has to understand specific strengths, weaknesses, and interests of struggling students. Pre-service teachers need to understand that learning about students takes time, effort, and collaborative work with other constituents.
- Higher Education faculty should bring more focus to special education strategies. Such strategies have to be explicitly and consistently addresses across all general education courses in teacher education programs. Doing so helps all future teachers with all students.
- Higher Education faculty should remind the pre-service students that structured social interactions benefit all learners.
- Innovations can transcend the classrooms to impact school level change.
- The classroom is a part of a larger system. Pre-service teachers need to realize that teachers in a building are a part of this system and can and should use the system resources beyond the classroom.

In our experiences requiring graduate students to develop an action research project to earn their MA degree, we have reflected and analyzed these outcomes to address teaching in our undergraduate education programs. Teaching for understanding and application and not just recall requires teachers to understand student thinking (Darling- Hammond & Snyder, 2002). However, student mindset and experiences change over time, thus, university faculty need to know the composition of students in today's Pre-K-12 schools. This can occur through working with graduate students and their action research projects.

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# Alienation Among School Teachers In Relation to Job Satisfaction Self-Esteem and Values

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## ABSTRACT

This study is conducted to study the alienation among teachers in relation to job satisfaction, self- esteem and values. A sample of 600 with nearly an equal number of male and female teachers is selected at random from elementary government schools. For studying alienation among school teachers in relation to job satisfaction, self-esteem and values it is proposed to use descriptive statistics mainly mean ,median , mode and standard deviation is applied, Relevant statistical techniques such as t-test and analysis of variance is used where two or more groups are to be compared.

#### **INTRODUCTION**

Under the impact of the forces of modernization and globalization, the traditional support systems such as the joint family and community living are under strain and so are the value systems which have been a successor to an individual under stress. Large scale migration of people in search for better life elsewhere, new modes of production, communication and economic activity on account of globalization have accelerated the feeling of alienation among people. The increasing use of facebook and whatsapp etc bear a testimony to an increasing need for social support arising from the problem of alienation among people.

Alienation is a state of being cut off or separation from a person or group of people. The Latin word for alien is alienus which means belonging to another". The idea of not belonging, or not fitting in, gave rise to the Latin verb "alienare" meaning "estrange", which alienation comes from.

Oxford Dictionary (1940), defines alienation as the state of isolation, alienation as an experience in which the person consider himself as an alien creature.

According to Seeman (1959), the feelings of normlessness, powerlessness, self estrangement, meaninglessness, and isolation and their consequences as a result of social, institutional and relational problems result in the development of alienation.

Powerlessnes describes the conditions, under which the individual lacks any control over not only their own product, but also over the outputs of the instruments they have used in this process.

Normlessness means to disapprove of the necessity of the behaviors, which are required to achieve one's objectives.

Isolation, describes either the lack of any bond of friendship, or participation in an organizational environment at the lowest level. Isolation may be experienced due to either the individual's departure from the society, or due to the individual's exclusion from its community.

Meaninglessness, describes the individual's failure in understanding their own activities, a failure in building a bridge between the present and the future.

Self-estrangement can be defined as the psychological state in which person deny one's own interests - of activities giving extrinsic satisfaction, rather than activities giving intrinsic satisfaction. A person becomes stranger to oneself, or to some parts of oneself or has a problem of self-knowledge or authencity.



In a broader philosophical context, especially in existentialism and phenomenology, alienation describes the insufficiency of the human being in relation to the world. The human mind sees the world as an object of perception, and is alienated from the world, rather than living within it.

In the theory of psychoanalysis, alienation is the divisions and conflicts between the conscious state and unconscious state of mind, and between the id and civilized.

Psychologists define alienation as an extraordinary variety of psychological disorders, including apathy, loss of self, loneliness, pessimism, powerlessness, isolation, anomie, anxiety states, anomie, despair, depersonalization, rootlessness, loneliness, atomization, and the loss of beliefs or values.

### ALIENATION

Alienation is a concept that refers to both a psychological condition found in individuals and to a social condition that underlies and promotes it.

Karl Marx's theory of alienation describes that alienation results from the private ownership of capital and the employment of workers for wages, and arrangement that gives workers little control over what they do. In alienated systems, people no longer work because they experience satisfaction or a sense of connection to the life process, but instead work to earn money, which they need in order to meet their needs.

Teachers effect the schools both quantitatively and qualitatively as they are responsible for maintaining social, political, and economic functions of the schools. Alienation to work averts teachers to be creative and to work for the improvement of vocational qualifications of the students, to make contribution in the development of the society, to make learning more effective and to cooperate with management and other teachers.

#### Types of alienation found in teachers are:

- 1. The alienation of the Teacher from their work.
- 2. The alienation from teaching itself where teaching becomes meaningless and mundane.
- 3. The alienation of the teacher from themselves as a social agent.
- 4. The alienation of the teacher from other students and teachers.

Teachers feel that they are controlled by economic forces, political forces and the social forces i.e. the force of negative public discourse. The professional views of the teachers have always been excluded from the process of decision making and it is very frustrating. They feel useless and worthless as they have no real say in shaping their work lives .For those teaching is worship, it becomes difficult to accept that they are mere workers who have to follow the commands of the management, even in most of the cases the management really does not know anything about teaching.

#### Job satisfaction

It is a feeling when an individual is satisfied from his job. This feeling is mainly based on an individual's profundity of satisfaction. Job satisfaction can be influenced by a person's ability to complete required tasks, the level of communication in an organization, and the way management treats employees.

Numerous definitions of job satisfaction have been given. According to some, job satisfaction simply defines that whether a person is happy from one's job and the working environment. But according to others it is more complex as multidimensional psychological responses are there.

The factor of job satisfaction has a great impact on the performance of the teachers. If the teacher is satisfied with the working conditions at the school, opportunity for advancement exists. respect from collegues and students is there, relationship with authorities is cordial, financial reward like honorarium compensation for extra work are there, workload is also bearable, then the teacher in all livelihood will be satisfied with their job and this will result into the lower level of alienation, alienation is one of the by-products of dissatisfaction in job.



#### Values

In examining the relationship between the manner in which we direct business and the principles to which we personally attribute, we are inextricably impacted by our respective bringing up, societal environments and academic influences. Robert Rue (2001) emphasizes that values are the essence of who we are as human beings. The way we live, behave and even do our daily activities are controlled by the values. Our decisions and also how do we make those decisions are all under the control of values we posses.

Allport and his colleagues, Vernon and Lindzey, created the Allport-Vernon-Lindzey Study of Values. The values scale outlined six major value types:

- 1. **The Theoretical** person gives more importance to search the truth and reality. And everything is knowledge based. No importance is given to beauty.
- 2. **The Economic** individual gives more priority to money. Their sole aim of life is to accumulate wealth. For them making money is the most important work on this earth.
- 3. **The Aesthetic** person places high value of form and harmony. They believe life to be a series of events that are to be enjoyed for its own sake. They have high aesthetic sense. For them life is very beautiful and should be enjoyed. They give least importance to money.
- 4. **The Social:** The highest value of the social type is love of people. Social persons are very kind, unselfish, down to earth, and full of sympathy for others. They give no importance to economic, aesthetic and theoretical values. They love the society selflessly and always work for the betterment of the people. Their main goal of the life is upliftment of the society. They give topmost priority to love.
- 5. **The Political:** The person with political values has sole aim to be dominant and has power in his hands. In each and every field struggle is there for power. The person would always try to be the leader. Such individual has a quality to lead the group. A content of selfishness will also be present in the personality of that individual.
- 6. **The Religious:** Religious individuals give the most importance to the unity. The values are normally based on the scriptures. For them political power has no importance. Religion is above all. Each and everything which is beyond the boundries of religion norms is wrong. Religion is supreme.

The bahaviour of the students is also influenced by the personality and the values of the teacher. The students perform better in the classes of their favorite teachers. They take more interest in subject of their favorite teacher. Even the percentage of attendance is high in the lectures of the favourite teachers. The teachers who are found to be outgoing, realistic, emotionally stable, enthusiastic, intelligent, assertive, independent, socially bold, confident, hard to fool, practical, experimenting, controlled, relaxed, conscientious give high performance as compare to the teachers who are reserved, less intelligent, emotionally less stable, humble, taciturn, expedient, shy, tender-minded, easy to get on with, imaginative, shrewd, depressive, conservative, prefers own decisions, undisciplined, tense.

High performing teachers are relatively high in social, religious theoretical, aesthetic, political, value than low performing teachers whereas in low performing teachers economic values are at peak.

#### Self-esteem

Self-esteem reflects a person's overall subjective emotional evaluation of one's own worth. It is, how do a person feel about oneself, whether the feeling of pride or shame, triumph or despair towards oneself. Self-esteem depends upon various factors like happiness, achievement in academics, satisfaction from job, marriage and relationships, etc.

Possessing little self-regard can lead people to become depressed, to fall short of their potential, or to tolerate abusive situations and relationships. Too much self-love, on the other hand, results in an off-putting sense of entitlement and an inability to learn from failures (It can also be a sign of clinical narcissism).



Self-esteem motivates people to give importance to themselves and also encourage them to work with their full potential to achieve their goals. High self-esteem act as great factor which motivate to fulfill one's dreams. On the other hand low self-esteem inculcate inferiority complex in the person, and the person is not motivated to persue their goals.

Self-esteem is considered to be a trait reflecting an individual's characteristic affective evaluation of self, low self-esteem and low general self-efficacy led to low teachers' efficacy and consequently substandard performance in the class. On the contrary, high teachers' efficacy is a reflection of high self-esteem and high general self-efficacy. Self-esteem influenced only in decision making, perceived education self-efficacy, perceived disciplinary self-efficacy, ability to get cooperation from community, and in the development of positive school environment of teachers' efficacy. A teacher with high self –esteem is full of confidence and satisfied from inside ,one perform his functions with full potential and is always ready to accept new challenges and never becomes a victim of alienation.

## **STUDY**

## **OBJECTIVES OF THE STUDY**

- 1. To construct Punjabi adaptation of Alienation scale by Hardeo Ojha (2010).
- 2. To construct Punjabi adaptation of Job Satisfaction Scale for Teachers by Meera Dixit.
- 3. To construct Punjabi adaptation of Value Test by R. K. Ojha and M. Bhargava (1992).
  - 4 To construct Punjabi adaptation of Self-esteem Inventory developed by Stanley Coopersmith (1981).
  - 5 To study alienation among elementary school teachers in relation to job satisfaction.
  - 6 To study alienation among elementary school teachers in relation to self esteem.
  - 7 To study alienation among elementary school teachers in relation to values.

## HYPOTHESES OF THE STUDY

The following non-directional research hypothesis have been formulated.

- 1 Teachers with high, average and low levels of job satisfaction will significantly differ on alienation.
- 2 Teachers with high, average and low levels of self-esteem will significantly differ on alienation.
- 3. Teachers who are high, average and low on theoretical values will significantly differ in alienation.
- 4. Teachers who are high, average and low on economic values will significantly differ in alienation.
- 5. Teachers who are high, average and low on aesthetic values will significantly differ in alienation.
- 6. Teachers who are high, average and low on social values will significantly differ in alienation.
- 7. Teachers who are high, average and low on political values will significantly differ in alienation.
- 8. Teachers who are high, average and low on religious values will significantly differ in alienation.

## **DELIMITATIONS OF THE STUDY**

The study will be delimited to the elementary school teachers working in government elementary schools. The study will be delimited to the districts of Gurdaspur, Mohali and Jallandhar.

#### **OPERATIONAL DEFINITIONS OF THE TERMS USED**

Alienation: Alienation is a state of being cut off or separate from a person or group of people.

Job Satisfaction: Job satisfaction is the state of satisfaction a person feels regarding one's job.

**Self-esteem:** Self-esteem is a confidence in one's own worth or abilities. It is measured with the help of Self-esteem Inventories developed by Stanley Coopersmith (1981).

**Values:** The values include six major values, such as theoretical (discovery of truth), economic (what is most useful), aesthetic (form, beauty, and harmony), social (seeking love of people), political (power), and religious (unity) as measured through.



#### METHOD AND PROCEDURE

For the present study, descriptive method of research is used to examine Alienation among school teachers in relation to certain demographic variables, self-esteem and values.

#### Sample

A sample of 600 with nearly an equal number of male and female teachers is selected at random from elementary government schools in the district of Gurdaspur, Mohali, Jallandhar.

#### **Research Tools**

Punjabi adaptation of Alienation Scale by Hardeo Ojha (2010) will be used which contains 20 items spreading over six dimensions i.e. (a) powerlessness, (b) normlessness, (c) meaninglessness, (d) social isolation, (e) self Punjabi adaptation of Job Satisfaction Scale for Teachers by Meera Dixit will be used which contains 52 items divided into eight area i.e. (a) Intrinsic aspect of job, (b) Salary, Promotional avenues and service condition, (c) Physical facilities, (d) Institutional Plans and Policies, (e) Satisfaction with authorities, (f) Satisfaction with social status and family welfare, (g) Rapport with students, (h) Relationship with co-workers.

Punjabi adaptation of Value Test by R. K. Ojha and M. Bhargava (1992) will be used. This test contains 45 statements which measures six values i.e. (a) theoretical, (b) economic, (c) aesthetic, (d) social, (e) political and (f) religious on the basis of Allport Vernon as per Spranger's classification.

Punjabi adaptation of Self-Esteem Inventories developed by Stanley Coopersmith (1981) will be used. It contains 25 items which are scored on a dichotomous scale ("like me" or "not like me") to provide a global measure of self-esteem. Higher scores indicate higher self-esteem.

#### FINDINGS

Teacher is a very important part of the society and is playing a crucial role in preparing the society to attain new levels of success and fame. Teachers play a significant role in preparing young people to live successful and productive lives.

The values which are developed in the teacher have a significant effect on the performance of the teacher. The theoretical, economic, aesthetic, political and religious value attained by a teacher, affect their personality. They are less alienated from their profession.

It is found that a teacher with religious value, is less alienated, as they have high self esteem and even the environment at the working place does not affect them.

It is found that the teacher who has economic values, if its satisfied with the salary, is less alienated from teaching.

It is found that the teacher, who has theoretical values, is alienated when the student's performance is not up to the mark.

It is found that the teacher, who has political values, is alienated when his ego is not satisfied.

It is found that the teacher, who has aesthetic values, is alienated when he is not respected by his students.

High self-esteem also plays a significant role in the performance of a teacher. It is found that a person with high self-esteem is less alienated.

A teacher who is satisfied from his/her job is found to be less alienated, and on the other hand an unsatisfied teacher is found to be more alienated.


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# Analogies of Algebraic Concepts: Examples from High School and University Mathematics

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## ABSTRACT

Algebraic concepts are the theoretical background of mathematics. Many students have difficulties with basic algebraic concepts at high school and at university mathematics. In this paper, it is mentioned two levels of algebraic structure defined: for high school algebra and for university algebra. Then it is given some models that high school algebraic structure elements are sub-elements of some university algebraic structure elements, and several elements of university algebraic structure are analogies of high school algebraic structure elements. Finally, it is presented some examples to support the theoretical way of the hypotheses. It is recommended emphasizing on the structural elements of algebraic concepts in high school algebra could make easier in university algebraic concepts or its structural elements.

Key words: algebraic concept, structural element, high school, university math

## INTRODUCTION

Mathematicians usually accept that a basic knowledge of how algebraic structure explains solving equations, simplifying expressions and unifying solutions as a main and essential knowledge for a high school mathematics teacher. Many high school mathematics teachers do not have a master degree or pedagogical certification of mathematics education in Turkey. Mathematics education research has shown that more mathematics preparation does not improve instruction, and may hinder a person's ability to predict student difficulties with mathematics (Darling-Hammond, 2000; Nathan & Petrosino, 2003; Nathan & Koedinger, 2000). For this reason, mathematicians and mathematics educators regard advanced mathematics knowledge that including an undergraduate major in the subject as potentially important for teachers.



Many high school teachers often feel frustrated and disarmed when faced with the inability of their students to cope with ideas that they consider to be so simple (Dorier, 2000). On the other hand, many students who arrive in high school with high level grades in mathematics from the intimidate school prove to be poor at algebraic manipulations. Specifically, some students give up advanced mathematics due to an inability to apply algebraic techniques in different contexts as in functions and limit (Hoch & Dreyfus, 2006).

Similarly, university mathematics teachers often notice their students' inabilities in conceptual understanding of mathematical notions (Novotná, Stehlíková & Hoch, 2006). Students coming to university having experience with sets theory, linear equations system and polynomial algebra, but they usually have problems with basic abstract algebraic concepts.

## BASICS OF HIGH SCHOOL ALGEBRA

The general situation is that students have difficulty with applying previously learned algebraic information in high school as a lack of structural understanding. Dorier (2000) suggested that students' difficulties with abstract algebraic concepts are in part due to their lack of understanding of structural notions.

According to Boero (2001), structure sense is an extension of number sense. He claimed that number sense can be described as an intuition for numbers that includes an understanding perspective for choosing the algebraic operation needed to solve a problem. Different perspective of thought is necessary to transform from an analytical approach to a global one (Kieran, 1991). Pierce and Stacey (2001) determined algebraic expectation, which includes identifying form to solution type.

The definition of high school structure sense is an operational definition that will enable to determine by observation whether a student is using structure sense (Boere, 2001). This definition was formulated according to theoretical considerations and empirical observations. In this study, an intermediate definition of algebraic structure sense used as a guideline to design questionnaires. These questionnaires, administered to students the end of  $10^{th}$  grade, were inadequate to identify some aspects of structure sense. Finally, we used the definition developed by Hoch (2006) as bellow;

- Recognise a familiar structure in its simplest form
- Deal with a compound term as a single entity and through an appropriate substitution recognize a familiar structure in a more complex form
- Choose appropriate manipulations to make best use of a structure

## BASICS OF UNIVERSITY ALGEBRA

Structure sense for university algebra was defined by Novotna et al. (2006). According to the definition, structure sense was developed by using observations of mathematics teachers, by analysis and classification of students' mistakes, and by looking for analogies with high school structure sense.

Novotna and Hoch (2008) distinguish two main stages of university algebra structure sense, SE and SP as follows.

Structure Sense as Elements of Sets and the Notion of Binary Operation (SE): Students are said to display SE if they can:

- Recognize a binary operation in familiar structures (SE1)
- Recognize a binary operation in non-familiar structures (SE2)
- See elements of the set as objects to be manipulated, and understand the closure property (SE3)

Structure Sense as Properties of Binary Operations (SP): Students are said to display SP if they can:

- Understand identity element in terms of its definition (SP1)
- See the relationship between identity and inverse elements (SP2)
- Use one property as a supporting tool for easier treatment of another (SP3)
- Keep the quality and order of quantifiers (SP4)



In this study, we analyze the following hypothesis that

H1. A student who does not have a high level of structure sense in high school cannot display a high level of SE2 in university algebra.

H2. SP in university algebra cannot be developed without a high level of structure sense in high school

H3: SE1 in university algebra is a generalization of structure sense of high school; in other words, a student who does not have a high level of structure sense of high school cannot display a high level of SE1 in university algebra.

H4: SP in university algebra is a generalization of structure sense of high school algebra.

#### ANALYSINING OF THE HYPOTHESIS

We present our theatrical perspective and give examples to explain our theatrical approaches to some hypothesis of the study.

H1. Let A be a set, and \* a relation between A x A and A. Usually teacher ask their students to find whether \* is an inner binary operation on A the mapping  $A \times A \rightarrow A$ . To perform the necessary steps requires structure sense of high school.

Example: Let  $a * b = \frac{4a^2 - 25b^2}{2a - 5b}$ .

Decide whether \* is a binary operation on the set of real numbers ( $A \le R$ ) and if so, determine its properties. The formula defining \* is in non-standard form. x \* y is not defined on R. Examining its properties requires structure sense of high school. Students may solve the task in this example without factoring. it is sufficient for them to remember the existence condition.

H2. SP deals with the properties of structures with binary operations. To find out if structure (M, \*) has an identity element and which elements of M have an inverse element, a search of algebraic expressions and solution of equations. So, this cannot be done without developed structure senses of high school. Example: Let us define (A, \*) as follows:  $A = Q^+ \cup \{0\}$ , and  $a * b = a + b + a^2$ 

It is obvious that \* is a binary operation on A. The following are examples of questions that require SP in university algebra:

Identity element: If yes, find it. In order to answer this question, the solver has to decide if there exists  $e \in A$  such that for each  $a \notin a$  the following is satisfied:  $a + e + a^2 = e$ , (the operation is commutative); the solving of the equation  $a + a^2 = 0$  with the unknown a. A student doesn't know structure senses of high school cannot find the answer.

Inverse elements: In order to answer this question, the following equation has to be solved for each  $a \in A$ : A  $a + a^{-1} + a^2$ .  $a^{-1} = e = 0$ . So, it is clear that structure senses of high school are needed for the solution.

H3: Structure sense in high school algebra is the operation of the simplest forms of algebraic expressions and equations.

It can be organized to determine the simple equations in standard form, if the students knows the general formulas of the concept. A few step substitution is enough. University algebra needs a typical treatment as that the general definitions are presented in students' understanding level.

H4: Structure sense in high school is about the finding of true formulations. SP in university algebra can be accept as analogies because of the finding true operational properties. Students may know the definition of identity and inverse elements, also many students can apply the general definition for the axiom of the question, but cannot be aware of the pay attention to the existence of identity element in the structure.



Students can know the formal definitions of properties, can be able to apply the definitions in individual steps, but cannot operate the consequences of the properties. For commutativity, if a binary operation is done to be commutative, then it is sufficient to determine the identity element of the operation.

## RESULT

In this study, it was presented theoretical approaches of the hypotheses. For this aim, it was used examples from high school mathematics and elementary basic university algebra. We can say that the knowledge and skills of students coming from technical vocational schools are the learning way on examples. On the other hand, the skills of the students attending from basic high schools and science high schools is based on more theoretical and more conceptual nature.

We analyzed high school and university algebra structure sense and showed how they are connected in the high school and university algebra. The transition from high school to university algebra could be analyzed with long-term learning strategy, which is cooperation of conceptual embodiment, perceptual symbolism and axiomatic formalism (Thomas, 1991).

Mathematics teachers need to focus on developing students' structure sense to make lower level their lack of structure sense. We can say that high school symbolic world structure sense could be basics of university algebra world structure sense. So, high school mathematics teachers should be make more emphasis on algebraic structure.

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# Anthropological Knowledge and Teacher Training : An Attempt to Prevent Teacher Attrition

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#### ABSTRACT

The French Guiana Educational District (Académie de Guyane). The first is related to its history, the second to demography. Indeed, it was born in 1996. Twenty years after its creation, the academy produces a population with little diploma and we note the slow drop in the rate of leavers without a diploma in secondary education. The status of French department in America, attracts populations - originating mainly from neighboring countries - in search of political and economic stability. As a result, in 2010, 62.3% of the population of the department aged 18 to 79 were not born in Guyana. Under the influence of this population growth, enrollment increases by 3.7% per year. Thus, the academy of Guyana is in permanent demand for labor, which requires the use of a large number of contract workers. Moreover, the academy is weakened by the important turn-over that affects the teaching force. On this point, studies have shown the effects of school climate on student stability, which in turn has an impact on academic performance. The problem of "vocational drop-out" of teachers is considered very seriously in several countries. In order to remedy this, the research proposed here concerns the training in anthropology of teachers which aims to deconstruct negative prejudices related to the cultural diversity encountered in the classes. The problem that emerged tries to understand how anthropology can answer the questions of the future teachers of Guyana about the cultural diversity that they will encounter in their class in order to prevent the professional dropout? Courses in intercultural anthropology have become objects of research. The methodology consisted in projecting images in order to analyze the representations of future teachers so that they could subsequently propose the same activity to their pupils in order to deconstruct the stereotypes.

#### INTRODUCTION

The French Guiana Educational District (Académie de Guyane) can be qualified as young for two reasons. The first is linked to its history, the second to its demography. It was created in 1996 following a strike by high school students, who initially demanded more personnel and facilities. Then, during negotiations with the Minister of National Education, the idea emerged to create a separate educational district for French Guiana in place of the French West Indies and French Guiana Educational District, whose headquarters were in Martinique, its chancellery in Guadeloupe. Eighteen years after its creation, despite positive signs (a 68.8% success rate for the "baccalauréat" in 2006, 82% in 2013, but declining in 2014 (79.4%)), the educational district produces few graduates. Moreover, this positive trend is dampened by the slow decrease in the rate of students leaving secondary education without a diploma (53% of young people aged 18 to 24 years in 1990, 43% in 2007). These young people rapidly find themselves unemployed. In parallel, the status of French Department in the Americas granted to French Guiana in 1946, attracts populations mainly from neighboring countries - in search of political and economic stability. Thus French Guiana remains, "[...] more than the other French overseas departments, a land of immigration: It has more "immigrants" (63%), persons born outside the department who have come to settle there, than "natives" (37%)" (Marie et al., 2012, p.1). Consequently, in 2010, these "immigrants" constitute 62.3% of the population of the department aged 18 to 79, including 42.8% born in a foreign country, 13.2% in continental France and 6.2% in another overseas department or collectivity. Due to its migration history, French Guianese society is made up of numerous sociocultural groups, where distinctions are often made between nationalities and cultural origins. For example, "Métropolitains" (the name given to whites from continental France) will be distinguished from French West Indians (Martinicans and Guadeloupians). Thus, sub-groups appear, increasing the number of categorizations. Today, within the French Guianese



population, the following sociocultural groups are distinguished without regard to their nationality: Africans, Amerindians (most of whom are French citizens), Brazilians (most of whom are of Amerindian descent), Chinese (most of whom are French citizens), West Indian, French Guianese, and Réunionese Creoles (French citizens), Haitians and Saint Lucians, Guyanese (Guyana), Dominicans, Hmong (French citizens), Lebanese (French citizens), Métropolitains, Maroons (descendents of runaway slaves, most of whom have Surinamese citizenship), Peruvians, Surinamese (Surinamese citizens who may be of Chinese, Indonesian, or Maroon descent), Venezuelans, etc.

Under the influence of this demographic growth, the number of pupils enrolled in schools grows by 3.7% per year, since the obligation to admit pupils falls under common law and compulsory school attendance. No residence permit is required for children. For that reason, demand regularly exceeds the number of available places. The French Guiana Educational District is constantly seeking personnel. For example, between 2002 and 2009, the number of teachers rose by 21% throughout the educational district. This strong demand leads to hiring a large number of contractual teachers (who represented 27% of teachers in 2009) (Irig-Défis, 2011, p.3). Moreover, the educational district is weakened by the high turnover rate affecting teaching staff. "Thus, 15% of teachers occupying a position in the Crétail Educational District wish to leave the department they have been assigned to (24% in Seine-Saint-Denis and 10% in Val-de-Marne) [...]. The percentage of applications to leave is also high in French Guiana (15%)" (La mobilité géographique et interdépartementale des personnels d'éducation et d'orientation, MEN, 2007, p. 97). On this point, numerous studies have highlighted the effects of school climate on the stability of teaching staff, which in turn has an impact on academic performance (Gottfredson & Gottfredson, 1985; Gottfredson, 2001; Auduc, 2001).

The problem of teacher attrition is considered very seriously in several countries, including Canada (Quebec) (cf. Royer, 2005) and the United States. Thus, a positive school climate constitutes a strength for the stability of the educational team; a major problem in the United States is the instability of teaching staff, or their quitting (between 40 and 60% in the first 5 years (Boyd, and al., 2006; Debarbieux and *al.*, 2012, p.6).

Similarly, Auduc (2001) points out that "the stability of personnel makes it possible to build long-lasting projects and to receive pupils in an establishment where those who work there have a sense of ownership".

In a context where, with 3.8%, the French Guiana Educational District has the highest proportion of non-French-speaking pupils enrolled (18,500 in primary schools; 16,200 in middle schools, and 3,400 in high schools – DEPP, 2011), studies conducted in schools necessarily look at the teaching approach taken by teachers. The obvious question in view of the situation on the ground is: How can a person, who has just recently passed their competitive exam to become a primary school teacher, with no knowledge of French Guiana's school population, nor of the context in which schools are established, nor any notion of any of the languages spoken in French Guiana, do their job under proper conditions? The approach taken to answer that question consisted in analyzing the course in intercultural anthropology given at the university. The details of this research will be developed below, but first, we present an overview of the history of the educational district.

## HISTORY OF THE EDUCATIONAL DISTRICT

The history of the establishment of the French school system in French Guiana shows that it was carried out gradually from the beginning of colonization and in a differentiated manner according to the populations involved. Schooling initially only concerned the children of white colonists. When the colonial administration took over in the late 19<sup>th</sup> century, after the abolition of slavery in 1848 and the establishment of secularization in French Guiana in 1888, schools gradually integrated the children of freed slaves. However, on the coast, the steady growth in the number of pupils was accompanied by an imbalance between rural Creole populations, who remained poorly educated, and an educated urban Creole elite, which affirmed its assimilation into Christian French culture. In 2007, the researcher Laurent Puren highlighted the fact that School as it was conceived in the post-slavery context of the 19th and in the first

part of the 20th century had no other ambitions besides creating, through a process of assimilation, a bourgeoisie of color that identified with the values of Frenchness. Accordingly, almost nothing was done to adapt education to the local environment: Schools in the colony were no different from their counterparts in continental France, either through their programs, school hours, or the language of instruction.

In 1852, there were approximately 1,200 pupils enrolled in French Guiana's schools, 2,500 at the start of the 20<sup>th</sup> century, and over 3,000 during the interwar period. Almost nothing was done to adapt education to the local environment:

On this point, Yvette Farraudière (1989) points out that from the outset of schooling, there was total silence regarding the linguistic particularities of the Creoles. No document issued by public instruction departments so much as hinted at the vitality of Creole, the vernacular language of villages and the countryside as well as of the working class neighborhoods of Cayenne. As for the Amerindian and Maroon populations, they were totally excluded from the process of assimilation. That exclusion was reinforced by the creation of the Inini Territory in 1930. Puren (2007) traces the history of school in French Guiana and points out that in 1930, the Inini Territory was created to control gold production located in the Amazon, reducing the colony of French Guiana to its coastal strip. The territory was administered directly by the governor of the Colony, represented locally by gendarmes. This administrative regime granted the Amerindian populations of the interior a unique status of "independent nations under protectorate" (Hurault, 1972, p.257). The administration did not interfere in the internal affairs of villages, which remained under the exclusive authority of customary chiefs. Those chiefs received a small monetary compensation, which was not a mark of dependence but simply a mark of distinction. Amerindians were not subject to French civil law (declaration of civil status, marriages, adoptions) and were governed exclusively by customary law. They paid no taxes, were not subject to compulsory school attendance, and besides, French Guiana's interior had no schools whatsoever.

In 1969, 40 years after its creation, the Inini Territory, which granted particular rights to Amerindians, was abolished, as the socioeconomic gap between the coast and the interior of the country was growing considerably deeper.

After the children of colonists during the era of slavery, the children of freed slaves living on the coast, schools began reaching the villages of the interior in 1949.

With French Guiana's transformation into a department in 1946 and the policy of « francization » (according to Jean-Marcel Hurault's expression), whose aim was to assimilate the populations in the interior of the country (whereas that of the Creoles on the coast was already well advanced), the schooling of Amerindians and Maroons began between 1949 and 1970 in the "Homes Indiens" (Catholic boarding schools based on the model of Quebec's "Pensionnats Autochtones"). Then, following the abolishment of the Inini Territory (1969), it was continued in the public schools that were progressively being opened. Having become French citizens, the Amerindians and Maroons were now subject to compulsory school attendance.

The access to school of the populations referred to at that time as the "Natives of French Guiana" is thus recent history. But, as was the case for the Creoles before them, the contents of programs were not adapted and mother tongues were ignored. The French Republic being one and indivisible, the different sociocultural groups present on French Guianese territory do not exist in legal terms. Non-recognition of the languages of minorities was the rule in the name of the unity of the French nation. By virtue of Article 2 of the constitution, French remains the official language of the department: "The language of the Republic is French." Despite the large number of languages in use, only French enjoys legal recognition. Still, French Guiana exercises certain competencies under Law no. 84-747 of August 2, 1984 on the competencies of the regions of Guadeloupe, French Guiana, Martinique and Réunion with regard to complementary educational and cultural activities relating to the knowledge of regional languages and cultures. On this point, Puren (2007, p. 282) concludes that



According to Laurent Puren, the period from 1946 to 1970, during which French Guiana became a department, was marked by the policy of francization and the first experiments with schooling Amerindians in Catholic boarding schools. It was Robert Vignon, the first prefect of the department of French Guiana (from 1947 to 1955), general counselor, senator of the department, and mayor of the municipality of Maripasoula, who instigated the reform on departmentalization. Prefect Vignon set up an assimilation policy that consisted in teaching pupils to speak, read, and write in French: "I tend to think," he wrote in his memoires, "that artificially keeping the Indians in medieval conditions, cut off from any evolution, is criminal."

As was mentioned above, the Creoles were already subject to the assimilationist policy established in schools starting in the 19<sup>th</sup> century.

Starting in the 1960s, Vignon put in place the first elements of his francization policy for the Amerindians. Its aim was to "foster the grouping and sedentarization of the populations in the interior". With the francization policy, the populations of the interior were granted French nationality. 65% of French Guiana's Amerindians thus became French citizens between 1965 and 1970. Pupils received a Christian education in French. For that purpose, several boarding schools were created on the western coast.

With the francization policy instigated by French Guiana's first prefect, Robert Vignon, pupils along the Maroni et Oiapoque rivers were introduced to religious boarding schools in the 1960s. This policy turned out to be a total disaster: Families were torn apart and several denunciations were made by parents. However, the time they spent in these establishments had the unexpected consequence of raising political awareness among former pupils once they reached adulthood. Many of the leaders of the Amerindian movement in French Guiana, which emerged during the 1980s, had been educated in those establishments. Far from achieving the goal of assimilating, through francization and Christianization, the pupils under their responsibility, the religious heads of the Indian boarding schools appear on the contrary to have inadvertently instigated a counter-movement, a quest for identity and a return to their roots.

After the Catholic boarding schools were abolished, public schools emerged where the program common to all the schools of the Republic was taught. It was out of the question at the time to consider dispensing an education adapted to French Guiana's regional languages and cultures. Confronted with this monolingual and monocultural education, pupils ultimately developed an inferiority complex. When they left home to study in the city, these young people were ashamed of their heritage, failed to return to their villages, and ended up living on the fringes of the rest of the urban population, due to their "ethnic" origin.

Nowadays, it can be observed that the situation has not radically evolved towards a greater taking into account of the cultural diversity and multilingualism of pupils, due to two factors: strong population growth and the conservatism of the educational institution. On this point, Pourchez (2002, p. 5) has made the same observation by describing the following issue relating to the island of Réunion: "Why do the institutions run by National Education know so little about and practically reject the local culture that fashions Réunionese children?" Similarly, Gérin-Lajoie (2006), in Canada, highlights the lack of emphasis placed on their role as « agents of linguistic and cultural reproduction » in the views expressed by teachers, since they "are not initially trained to fulfill that role, nor do [they] receive the necessary support to carry it out [once] they find themselves in the classroom" (2006, p.173).

Strong population growth, the inability to speak French of native-born as well as migrant pupils, the fact that schools are located in villages that can only be reached by river or by air, exacerbate the negative image of schooling in French Guiana (Hidair, 2014). In order to solve this issue, the research proposed here addresses the training in anthropology given to future teachers at the University of French Guiana's School of Teacher Education. We examine the following issue: How can anthropology provide answers to the questions asked by French Guiana's future teachers regarding the cultural diversity they will encounter in their classrooms, in order to prevent them from quitting the profession? To address this question, the courses given at the School of Teacher Education, which are based on research, became the subject of research themselves. The methodology used consisted in filming intercultural anthropology classes in order to analyze trainee teachers' representations based on images of diversity shown during a tutorial session.

The idea was that these future teachers should themselves be research subjects, so that afterwards, they could propose the same activity to their pupils in order to deconstruct prejudices. Today, an anthropologist needs to be able to respond to numerous requests as well as to the expectations of training institutes and the objections of different groups. This is a perilous enterprise, since the anthropologist is at the heart of interactions and plays the often difficult role of interpreter of society, and must then train the group of teaching students whom they are at the same time studying. The frustrations, anxieties, preconceived notions, and enthusiasm of their students must be channeled, but that is a long-term undertaking for which researchers have not necessarily been trained. An anthropologist learns on the job, which means that they are not immune to mistakes such as impatience, when concepts are not understood, or intolerance, when prejudice takes the place of scientific discourse. Teaching anthropology may thus require the researcher to analyze their own practice.

## THE TEACHING OF ANTHROPOLOGY IN FRANCE

For a long time, anthropology was a poorly understood, even confidential, field of study in France. Jamin (1991, p. 290) points out that «the hesitations concerning the very term to use to designate, in France, anthropological research – *ethnography, ethnology, or anthropology* (...) – clearly convey this wavering theoretical identity." He adds that "France was one of the last great Western – and colonial – powers to establish specialized teaching of ethnology and to build up a corps of professional ethnologists."

Lefebvre (2001, pp.6-10), by studying the professional curricula of certain ethnologists through the history of cultural policies and that of the Mission du Patrimoine Ethnologique, observed that during the 1960s and 1970s, ethnological activities on French subjects took place within a network of non-profit organizations which, for the most part, served as relays for institutions such as Arts et Traditions Populaires, the ethnology laboratories of the National Center for Scientific Research (CNRS), and university teams. Then, "the emergence of a new policy at the Ministry of Culture in the late 1970s, and especially in the early 1980s, modified this configuration somewhat." A certain ambiguity emerged between the "Mission du Patrimoine, which was originally supposed to draw support both from the non-profit network of the 1960s, academics, CNRS laboratories, while at the same time claiming a certain autonomy that had yet to be constructed. For some people, the composition of the different Heritage Councils [Conseils du Patrimoine], from 1979 to the present, accurately reflects the ambiguities of this policy. In parallel, the dwindling of subsidies over time, which was unanimously highlighted, crystallized tensions, challenges, and the conflict between non-profit organizations, territorial institutions, universities, and research laboratories." In the mid-1980s, ethnologists had to "create" their position in conjunction with regional councils and " (...) afterwards, in recent years, these prospects of professionalization have dried up, as have the possibilities for carrying out so-called 'personal' research' (...). Young ethnologists lost their illusions with regard to the line willingly peddled by 'established' tenured researchers, and no longer undertook long-term research such as that required for a doctorate. An entire current of professionalization thus was lost to ethnology during this period (...)." In other words, we can consider that different policies combined with the narrow labor market did not promote the visibility of the profession.

Over a few years, the situation has evolved from one of complete anonymity to that of widespread recognition : Anthropologists are consulted in the media, in businesses, in ministries. Their expertise (or at least their point of view) is sought just like that of sociologists or psychologists, as soon as the subject addressed is the "Human Being". It is true that often, anthropologists specialized in a particular field of anthropology are consulted, and they are often expected to provide an "exotic" touch: ethnopsychiatrists, ethnophotographers, anthropologists specialized in religion, in a precise group or society, media anthropologists, etc. In any event, anthropology has emerged from anonymity and anthropologists, when they speak about their profession, increasingly meet with a positive response: Their interlocutor has already heard that word, even though it is still often necessary to specify what this science consists in and in particular, what differentiates it (or not) from sociology.

Despite this recent visibility, professors of anthropology are still confronted by numerous obstacles. Based on observations made in French Guiana, we found that the most unexpected obstacles relate to the TCJET

audiences on the receiving end of this teaching. Most often, anthropology is not considered a science and can even generate rejection, in particular when the theories discussed challenge the preconceived ideas of the students being trained. In fact, the latter often have only a very vague, even inexistent, idea of what this science is all about. For example, every year during the Fête de la Science science festival, the pupils met in primary and secondary classes are very surprised to learn that human sciences exist. Once they reach adulthood, it is clear that that lack of knowledge remains unchanged. Confusions appear with archeology, ethology, or even entomology.

Once the discipline has been presented, students' feelings oscillate between lack of interest and failure to understand why such a course is being offered as part of their curriculum. Hence the recurrent questions – which also reflect numerous prejudices - regarding the usefulness for their professional practice, or even their daily life, of acquiring this type of knowledge. Many students imagine that anthropology is only concerned with "primitive peoples". One only has to consult the different anthropological and ethnological journals published over the past 50 years to observe the change that has taken place in terms of the topics and research areas covered by the discipline: From so-called exotic societies, the focus shifted to rural France and finally to urban anthropology and contemporary phenomena such as sports or the Internet. One can notice the changes when browsing through the tables of contents of these journals. The journal L'Homme, in particular, is quite representative of this trend, with an entire issue devoted to anthropologists and the contemporary world (No. 185-186, January/June 2008), but also a marked refocusing during the years 1990-2009 on Europe and contemporary phenomena in the West and/or in urban settings throughout the world. This focus, widespread throughout French society, was strengthened in French Guiana, where many researchers – who began their work in the early 1970s – were initially interested in rural populations before focusing their research on the urban environment (the research of the geographer Jean-Marcel Hurault on the descendents of the Aluku Maroons (1961) and on the Wayana Amerindians (1968); Richard and Sally Price on the descendents of Saramaka Maroons (1972); Pierre and Françoise Grenand, who worked at length on the Wayampi Amerindians (1979)).

Furthermore, students who have been sensitized to anthropology generally have expectations that do not meet the reality of the subject matter, hence the resulting feeling of disappointment. Thus, certain students hope to be able to fill out "data sheets" – providing information on the cultural practices of groups – that could be used as instructions they could consult to know how the "ethnic groups" around them feed themselves, sleep, dress, think, or raise their children. It should be emphasized that the notion of "ethnic group" is often automatically assigned to non-Western populations and is often used as a euphemism (or "politically correct" synonym) for "tribe".

Other students, convinced of the legitimacy of their anti-globalization ideologies, hope that anthropology conveys a political message of support to oppressed peoples. But many of them do not expect to call into question their own representations. Thus, discovering that anthropology involves first and foremost questioning one's own ways of functioning, of being and seeing, can be shocking, even destabilizing for most of them, who cannot for a moment imagine that anthropology isn't limited to the study of peoples "of rural, traditional, non-Western culture," but that it also studies the West and urban culture, including contemporary French society. In this regard, it is interesting to note that "rural, traditional, non-Western culture" is frequently referred to by Westerners using the term "ethnic group". "Ethnic" furniture, fabrics, jewelry, music, and ways of life denote the practices and beliefs of rural non-Western populations. In other words, these "ethnic" artifacts are simply the figments of the Western imagination projected onto the stereotyped Other.

These varied expectations with which the anthropologist is confronted raise numerous questions, such as the relevance of these lectures, the credibility accorded to this science by program directors while they do not define it clearly for themselves, the impact on students/pupils, since the needs of the training program in terms of anthropology have not been clearly identified, and the need to very rapidly present a discipline, to demonstrate its scientificity, and finally, its value in general and in relation to the training program.



Consequently, responses to anthropology lectures vary widely. In the best of cases, students who take an interest are able to see the relevance to their training and their future profession (provided that these inputs do not radically upset their egocentrism). At worst (and this is the case observed to a large extent), anthropological content is rejected, perceived as being non-scientific, thus unfounded, and also considered on the same level as value judgments. For this reason, course content is systematically called into question, particularly when it contradicts conventional wisdom considered to be scientific and evidence conveyed by "mass" knowledge. Thus, when the anthropologist discusses certain very sensitive topics, such as the relativity of the notion of instinct in humans or homogamy in Western societies, the reaction of certain students is invariably "I don't agree", revealing clearly through this expression that the content is interpreted as opinion and not as scientific fact.

In this regard, below we present the observations carried out between 2002 to 2010 among trainee primary school teachers at the French Guiana School of Teacher Education (ESPE).

## ANALYSIS OF THE ANTHROPOLOGY COURSE

First of all, it should be noted that the course in anthropology was entitled « Intercultural Teaching ». During the first two years, only one 2-hour tutorial was devoted to this course over the entire academic year. Then, in 2004, class time was increased to six hours, then was switched back to two hours until 2009. The amount of class time was decided according to student availability, since the course was programmed to take place at the end of the academic year. At the beginning of the 2010 academic year, due to the opening of a master's program entitled "Teaching and Training Professions", anthropology took the form of a course entitled "Teaching in a Multilingual and Multicultural Context. Knowledge on Populations".

It is regrettable that so few hours are devoted to intercultural instruction, but one advantage should be highlighted. The contents of the course have always been left to the judgment of the professor. Hence, the choice was made to focus on the study of ethnocentrism (Lévi-Strauss, 1950), the definition of interculturality (Abdallah-Pretceille, 1992 & 1996), and the analysis of representations, prejudices, and racist attitudes (Adorno, and al., 1950; Pierre-André Taguieff, 1991 & 1993).

Since between 150 and 200 people were enrolled in classes, students were separated into five or six groups depending on the year. During the first course given in 2002, the classic lecture format was chosen in order to have enough time to cover all the topics planned. From the start, it became clear that this method was totally inappropriate for the target audience. Forced to attend tutorials due to their status as trainee teachers, students seemed surprised that such a course had been scheduled. Surprise gave way to impatience, then rejection of the content considered "obsolete". The arguments advanced highlighted the French Guianese "melting pot", that singlehandedly proved the future of "métissage" and therefore the obvious end to ethnocentrism and racism. Yet these declarations were accompanied by attitudes that revealed contradictions. For example, comments made about pupils of foreign nationality or belonging to a non-Western culture (Hidair-Eliville, 2010) demonstrated that racial prejudice clearly existed.

Analysis of these initial reactions made it necessary to rethink both the content and the format of the course. It was clear that these research topics could not be presented in the form of a classic lecture succinctly addressing such sensitive subjects. Moreover, this audience showed a strong desire to participate and give their opinion, thus involuntarily preventing all of the course content from being covered, due to a lack of time. It was therefore with a feeling of real frustration on all sides that the course ended, with no possibility of adding extra sessions to finish the material.

As a result of these obstacles, the following year, the strategy consisted in devoting more time to definitions of the concepts discussed and then initiating a debate based on case studies. The course in "intercultural teaching" was now made up of two sequences, with the first presenting scientific definitions of many concepts used in everyday language such as "melting pot", culture, identity, immigration, intercultural, racism. Then, new concepts were addressed, such as ethnocentrism and cultural relativity. Finally, the lecture ended with case studies presented using representations of interculturality in French Guianese society (photos, postcards, works of literature, games, etc.). On this point, it should be underlined that the image of French Guianese cultural diversity is that of a hierarchical and categorized mosaic. Each

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sociocultural group is considered to possess natural physical and cultural characteristics inherited from their ancestors, and the characters represented in comic albums or on postcards are associated with a sociocultural group according to their phenotype. Similarly, the languages spoken are represented in a compartmentalized fashion.

To highlight the connections between the characters – in order to then, by extension, show the connections between the individuals present in the room – the sequence continued by asking eight questions about all the photos presented, for which a choice between three answers was proposed: "completely possible", "maybe possible", and "impossible". The eight questions were: Do they have the same mother? Do they have the same nationality? Do they have the same blood type? Were they born in the same city? Are they the same age? Do they have the same mother tongue? Do they share distant ancestors? Can they donate organs to one another ?

The second part, which lasted an hour, was devoted to discussion, the students having been instructed not to comment during the theoretical lecture and to begin the discussion based on the material used for the case studies. These rules were immediately accepted. The students were amazed by this teaching approach and participated enthusiastically in the debate. The aims were to speak about oneself rather than about others, to broaden the perception of the notion of culture instead of limiting it to "folkloric" aspects (dances, costumes, food), to highlight how prejudice functions, to provide targeted information on the history of immigration, insisting on the fact that even indigenous populations resulted from migratory movements, and lastly, to accept others as people and not as representatives of an ethnic group.

After these successful sessions, it became clear that the debates should be filmed. The richness of the opinions and comments expressed, the strong feelings that emerged, and the freedom of tone taken by the students confirmed that it was necessary to preserve a record of these exchanges in order to transcribe and then analyze the contents. Therefore, in 2008, all the sessions were filmed.

The analysis that followed was based on the works of Elisabeth Kübler-Ross, psychiatrist and psychologist, pioneer of the palliative care approach for persons at the end of life. It is interesting to observe that the Five Stages of Grief (Gilliland & James, 2005, p. 365) - which Elisabeth Kübler-Ross initially applied to any form of catastrophic loss (job, income, freedom) - can also be applied to the loss of power. To better understand the analysis approach, this collection of comments should be taken in its context. These were trainee primary school teachers, both beginners and some with experience, who for the most part had very little knowledge on the sociological situation in which they were exercising their profession. There are two main reasons for this: First, for those who went to school in French Guiana, it must be noted that the regional context is rarely taught, with attention focused on the national context. Secondly, due to a shortage of qualified teachers in the educational district and to population growth, the non-local background of teaching staff, who come mainly from continental France and the French West Indies, must be underlined. These teachers quickly find themselves helpless when dealing with pupils, whose maternal culture as well as their school culture is different from their own. Therefore, to preserve the teacher's power and position of authority, they adopt the attitude, at times inflexible, of the educator, whose job is to uphold the principles of the French State: "School should not differentiate between pupils, all must have access to French education", but omit the fact that that education is transmitted to the detriment of the pupils' own culture.

When analyzing the contents of the debates on the « melting pot », culture, identity, immigration, interculturality, racism, ethnocentrism, and cultural relativism, we observed that the « five stages of grief » could be discerned. According to Elisabeth Kübler-Ross, these stages do not necessarily occur in the order indicated. Moreover, all the stages are not necessarily experienced by all patients, but each victim will experience at least two of them.

First, we observed Denial. Many students denied the reality of the facts. The following comment was recurrent: "You're exaggerating, racism is not that widespread". With regard to the stereotypes in the works of children's literature, we heard: "That's not racial prejudice, it's just to help the children understand", "All of that creates a humorous effect", "Where I'll be teaching, classes are homogenous", or "The people who are ethnocentric are the Bidochons [comic book characters that represent a caricature of the French] with their flip flops and socks, I don't feel that that relates to me". But clearly, discovering that ethnocentrism affects all human beings made quite a few people ill at ease. Some students tried at all cost to stand out from



the group, pointing out their open-minded attitude since "they wear backpacks and hiking boots and are interested in exploring different cultures".

Then, we observed Anger, which manifested itself in the form of people leaving right in the middle of the discussion, under the pretext that they « felt shut in », that they « couldn't speak », that "people systematically contradicted them". These reactions generally occurred after a series of answers was provided by the anthropologist that contradicted the statements of the students, such as "Racism is for stupid people, there are idiots everywhere", "I'm a teacher with a continental French background and I'm going to be teaching Amerindians, so I'm learning about their culture: Which of the two should come out on top?" Most often, answers relating to the universality of racism and to identifying the power relationships that exist between sociocultural groups bothered students. Some left the room, claiming that their questions had not been answered.

The Bargaining stage was often characterized by the idea that they « would like to do things differently, but the system prevented them", or that they "had to follow the National Education program", that "The inspector would penalize them if they didn't do it", that "They weren't trained for that" and that "There aren't any books showing children with no skin color". All these arguments aimed at laying the blame on the French State, on publishers, and on the mysterious "system" which seemed to resemble a sort of invisible power that dictated their acts and of which they refused to admit they were an integral part.

The Depression phase usually took place after the course. Certain students came to talk in private, so as not to be seen by the others, in order to acknowledge their helplessness and their lack of understanding of the interactions they found themselves at the heart of. In such cases, they admitted that they were powerless, that they "denied the differences or accepted the stereotypes because they wouldn't know how to talk about the diversity around them", that "they didn't understand a thing about migratory history".

The Acceptance phase took the form of requests for bibliographic references that could help them continue this reflection. Students also expected to receive advice on how to organize similar discussions in their own classrooms.

#### FROM MOSAIC TO IMPRESSIONISM ...

The research presented here took as it starting point the observation that it is common to read or hear French Guiana officially defined as resulting from a "mosaic of peoples". The suppositions on which that definition is based deserve to be closely examined: What is meant by mosaic? Under what conditions can one speak of a mosaic? What form does it take in French Guianese society? In order to answer those questions, inspiration can be drawn from the work done in French Guiana by Chalifoux, which consisted in identifying the three main study models used in French Guiana: Mosaic, binary, and vertical mosaic (1997, p. 96).

The mosaic model most commonly used, and which is found in administrative, academic, and informative publications as well as scientific research is: « French Guiana: mosaic of peoples and languages», Grenand et Bergounioux, http://www.dglf.culture.gouv.fr/Seminaire200202/palikur2.htm ; « Thus, French Guiana became an exceptional mosaic » (Bechet, 2012, p.35). In this model, the ethnocultural groups that make up French Guiana's population are listed, and this classification is accompanied by brief summaries of the major cultural traits of the broadly stereotyped "ethnic groups". This vision helps strengthen cultural gaps and presents intercultural relations as relations of exclusion (Chalifoux, 1996, p. 96).

This ossified description is found in the text below, which is widely quoted in doctoral theses, on websites, and in school textbooks :

We could sum up the situation ironically by saying that Whites are first of all the representatives of order (prefect, high-level civil servants, gendarmes, doctors, anthropologists, etc.), then top-level business leaders, expert technicians, and scientists; as for the Creole-speaking people of French Guianese origin (rarely drawn to industrial jobs), they control the administrative positions and local services; the Amerindians are still terrific hunters and boatmen; but the Chinese reign over retail shops, the Hmong grow the vegetables, the Surinamese and Brazilians toil on construction sites, the Haitians cut the grass and pick up the garbage, etc., not to mention Haitian and Brazilian women who clean house (off the books). We could add that the Americans fish for shrimp, the Venezuelans, for Caribbean red snapper, whereas the

Canadians (Guyanor, Cambior, Asarco) run the big mining companies. With real unemployment that affects 40% of the population, it is easy to understand why immigrants have become "undesirable", all the more so because they are responsible for around 60% of births. The French Guianese also believe that Surinamese and Brazilian immigrants bring violence with them (Excerpted from : http://www.axl.cefan.ulaval.ca/amsudant/guyanefr2.htm).

This categorization masks the dynamics of intercultural relations, whereas culture is structured by means of the interplay of reciprocal representations and is fashioned by interaction: what we think of others, but also what they think of us (Abdallah-Pretceille, 1996). This mosaic model juxtaposes identities, in much the same way as the decorative art that assembles fragments of colored materials to form a design. Yet society is far from being a work of art frozen in time. A useful analogy could be drawn to impressionist painters, who thought of themselves above all as painters of the living world. A comparison might also be made with life and earth sciences, which describe the chameleon's changing of color as the reflection of an emotion adapting itself to the environment or the climate.

With regard to the binary model, it positions intercultural relations on the vertical axis of relations of domination. The studies of Hurault (1972) and Jolivet (1982) deal with relations between Creoles and continental French or between Amerindians and continental French. "These analyses generally use frameworks inspired by third world or neo-Marxist approaches, which highlight socio-political contexts of intercultural relations" (Chalifoux, 1997, p.97). Emphasis is placed on the social, economic, and political asymmetry between local authorities and the mother country, and intercultural relations are addressed from the angle of assimilation, acculturation, and resistance. Horizontal relations with the other cultural groups in French Guiana is only marginally considered.

Finally, the vertical mosaic model combines the two preceding models and places intercultural relations in French Guiana in the context of socio-economic stratification. In this regard, Chérubini showed, in 1986, that certain sociocultural groups integrated through the economy, such as the Chinese and the Lebanese, whereas other integrated into French Guianese society by means of social mobility (the Javanese, for example). The integration of other groups depends on their economic and social position, as is the case for Haitians and Brazilians. The Saint Lucians and French West Indians, on the other hand, experienced another form of integration, as they had more time to participate in intercultural exchanges (Chalifoux, 1997).

We conclude with a discussion of the different theories that guided this research. First, we take into account the fact that relations between these different theories are neither linear nor impermeable. As is the case for identities, the categories of each of these theories appear to be multiple. Thus, it is acknowledged, since the work of Barth (1969), that "ethnic" phenomena are constructed and not natural. This leads to new perceptions: Certain authors address the question of the phenomena of identity construction as classifications carried out by members of the group (Oriol, 1984; Meintel, 1993), while others contribute, with their vision, the idea of interventions such as those of colonial administrators or ethnologists "and of those who combine both qualifications" (Amselle, [1990] 1999, p. 22 but also Williams, 1989, p. 420).

The relational rather than the essential character of identity is fundamental. "We" is built in relation to "Them" and emerges through a process of construction of the forms of interaction that introduce a separation and presuppose a common social context. Identity does not possess an inexplicable character, involuntary and natural, it is constructed and not defined by objective, immutable criteria. Barth's analysis made it possible to show that it is determined by the strategies, both individual and collective, of agents, and can go as far as rejection or modification of identity, which is above all a means used to classify (Devereux, 1972).

To construct their identity, an individual accumulates distinctive characters that enable them to recognize those around them who resemble them (Devereux, 1972). They must choose between an infinite number of possible and integrable identities. According to Abou (1981), identity in general appears where difference arises. Affirming identity is first of all a defense, difference is perceived as a threat (p. 31). Identity is a factor of social unification, "it is also the result of the processes of identification, assimilation, and differentiation by which the group seeks to found its cohesion and mark its position in relation to other groups" (Lipiansky, 1995, p. 39).



Bonniol underlines that « identity plunges its roots in the fundamental processes corresponding to an activity of categorization that presides over the recognition of self and Other" (1992, p. 20). In this same vein, the approach taken by C. Taylor emphasizes the idea that all identity is constructed in interaction with "significant others". He refers to both the collective as well as the individual identity. « We define our identity always in dialogue with, sometimes in struggle against, the things our significant others want to see in us » (1992, p. 33).

Research carried out by Abdallah-Pretceille (1992 & 1996) points out that in order to understand others in their difference, one needs to know who one is and how acquiring knowledge about others can promote self-knowledge. The author's theory gravitates around a central axis, the aim of which is to fight prejudice by engaging in introspection and self-analysis, with resulting explanations being projected back on oneself and not on someone else. The author proceeds from the assumption that "the adoption of attitudes towards others depends mainly on the perception the individual has of themselves or the group to which they belong" (1996, p.182). In other words, knowledge of others entails "a deepening of one's own personality, of one's own way of functioning, reacting, being, and seeing" (1996, p.181).

#### CONCLUSION

Teaching intercultural anthropology is a perilous undertaking, since the anthropologist, in the role of teacher, is at the heart of interactions and occupies the often difficult place of interpreter of society. The frustrations, anxieties, fanaticism, or enthusiasm of students must be channeled, but developing that art is a long-term undertaking for which anthropologists are not trained. An anthropologist learns on the job, which means that they are not immune to mistakes such as impatience, when concepts are not understood, or intolerance, when prejudice takes the place of scientific discourse.

This educational approach aims above all to foster respect in a multicultural society, develop understanding of others, promote the experience of life in a democracy, and sharpen the critical thinking of future teachers so that they, in turn, can "teach their pupils to learn" in order to overcome preconceptions.

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# Appreciative Critical Reflection in Transformative Learning Process for Enhancing Self-Esteem of Undergraduate Public Health Students: A Qualitative Study

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#### ABSTRACT

The undergraduate public health students must work with other professionals, so the high secure self-esteem is important. The main aim is to develop a high secure self-esteem. One effective way to enhance high secure self-esteem is transformative learning process. The purpose of this study was to synthesis a transformative learning process for enhancing self-esteem of undergraduate public health students. The design was a qualitative research that triangulated by systemic reviewing, observing and interviewing in rural field training. The finding was a cycle of disoriented dilemma, proposed premise, inspiration and practice with appreciative inquiry and critical reflection in each step (D-P-I-P with AC).

#### **INTRODUCTION**

Children and juveniles are considerable of cooperated human resources development. For development, the youths should be involved at all levels of society. The social, economic and technological changing effected in the lifestyles of children and youths, especially the lack of proper socialization process and the warmth of families. The more context transformations, the more complexities of social problems. Some studies found that the current juveniles have low self-efficacy and self-respect due to intervened society by self-image focusing. Empirical studies have shown that juveniles were more likely to do things that showed their self-images and disregard for the rights of others to inflate self-esteem or self-esteem blown to narcissistic proportions (Ang, 2005). The equated feeling good, arrogance, narcissism and traits could lead to violence are misconceptions of truly authentic self-esteem. He describes authentic or healthy self-esteem as a person's overall judgment of himself or herself dealing with self-competence and self-worth based on reality can fluctuate from time to time (Mruk, 2006). The experience of self-efficacy and self-respect, and has six pillars namely, living consciously, selfacceptance, self-responsibility, self-assertiveness, living purposefully and personal integrity (Branden, 2001). It was a dual informed construct based on worthiness (affective dimension), what calls the qualities of lovability, likability, moral self-approval, and body appearance are more value oriented, and competence (behavioral dimension), what the test calls competence, personal power (or influence), self-control, and body functioning are behaviorally based or action-oriented qualities, and the interaction thereof in a meaning-making process. The main purpose would be to develop a secure high self-esteem which involves a two-factor meaning making matrix of high worthiness and high competence. However, it is crucial to remember that people with high selfdefensiveness usually indicate that there is likely to be a problem with self-esteem, the individual is anxious about his or her self-esteem, often in ways that are difficult to detect upon first glance, as in the case of the successful overachiever. Therefore, it is important to treat people by interpreting self-defensiveness. That is useful in detecting various forms of unstable or fragile self-esteem, such as being too moralistic, rigid, or self-deceptive (O'brien & Epsten, 1988). One effective way to strengthen self-esteem of youths is design and implement transformative learning by explaining the process of formulating more dependable beliefs about experience, assessing their contexts, seeking informed agreement on their meaning and justification, and making real decision on the resulting insights. Transformative learning has not only generated "autonomous thinking", as it would, but also autonomous action stimulated by an emotional sense of empowerment and the experience has improved individual's secure self-esteem as a practitioner. Transformative learning "is the process of effecting change in a frame of reference". Frames of reference are defined as the structures of assumptions and expectations



through which we understand our experiences (Mezirow, 1997). In each curriculum, Mahidol university, Faculty of Public Health has always participatory learning by reflection in all classes and stretch the importance of developing public health students to be personnel for the public health service for able to work in a multidisciplinary interactive team environment. To this end, for over 5 decades, the faculty has introduced a field training program in rural health development to be directed students from all disciplines. The objective of the program was and continues to be to develop rural health development skills using a multidisciplinary approach to the problem solving process to assess the rural health problems and subsequently develop solutions. The field training component was based on a concept of using a role community as a center for learning of the public health students. Upon completion of the field training, the students will have integrated and applied the theories first learn in the classroom, they will also see the importance of working as a part of a team of public health workers and community people. With knowledge and experience gain in the classroom and through the field training experience, the faculty of public health feels that our students are prepared to become partners and leaders in the communities in which they will work (Silawan, 2015). The under graduated public health students' unstable confidence will lead to the problems of integrated work in the future. Thus, the transformative learning process in real situation of field training can improve the public health students' high secure self-esteems for competences and worthiness of health professionals.

## **OBJECTIVE**

To synthesize a transformative learning process for enhancing high secure self-esteems of undergraduate public health students

## THE STUDY

The design of this research was a qualitative study triangulated by systematic reviewing, observing and interviewing of undergraduate public health students in rural comprehensive field training. Thus, there were 2 steps in our research. Step 1) the systematic reviewing considered research from over the world. We only included literature published in well- known journal and research. We chose to be as broad as possible in our sweep of the literature, and included research using a variety of methodological designs, including qualitative work, case studies, as well as surveyed-based research. Research reported in book chapters, scholarly books and organization reports was excluded, and remains an area that future research may wish to examine. Four databases were searched: PubMed, Sage, Ebsco and Eric. Strict search terms were used to search these databases. We developed these terms through a series of scoping search searches to assess each term's sensitivity and inclusivity before agree on final set. The target terms were authentic self-esteem, transformative learning, and associated terms. Truncations were used in order to search multiple iterations of particular word stem. Systematic searches involved pairing each word in target term and associated term in the title, abstract, and keyword fields. Step 2) the observing and interviewing of senior undergraduate public health students in comprehensive rural field training in Wang Mouang district, Saraburi province, and Bangphae district, Ratchburi province, Thailand for six weeks. The students stayed in the villages to learn and get experiences from authentic situations for higher respect, self-competence and self-worthiness.

## FINDINGS

In total 72 searches were completed, which returned 1,514 pieces of literature. These record were then imported into reference management database for further analysis, duplicate removal and application of screening criteria to exclude items not relevant to the review as showed in Figure 1.



#### Figure 1. diagram of systemic reviewing of this research

The theory of transformative learning has evolved from three common themes in Mezirow's theory are centrality of experience, critical reflection, and rational discourse, which is based on critical social theory and psychoanalytic theory (Scott, 2004). So, critical reflection is the main component of transformative learning. Critical reflection occurs when we analyze and challenge the validity of our presuppositions and assess the appropriateness of our knowledge, understanding and beliefs given our present contexts. Critical reflection involves three phases: 1) Identifying the assumptions ("those taken-for-granted ideas, commonsense beliefs, and self-evident rules of thumb" that underlie our thoughts and actions; 2) Assessing and scrutinizing the validity of these assumptions in terms of how they relate to our 'real-life' experiences and our present context(s); 3) Transforming these assumptions to become more inclusive and integrative, and using this newly-formed knowledge to more appropriately inform our future actions and practices (Brookfield, 1995). Perspective transformation explains how the meaning the meaning structures that adults have acquired over a lifetime become transformed. These meaning structures are frames of reference that based on the totality of individuals 'cultural and contextual experienced and that influence how they behave and interpret events. An individual's meaning structure will influence how she chooses to vote or how she react to women who suffer physical abuse. The transformative learning occurs when individual change their frames of reference by critically reflecting on their assumptions and beliefs and consciously making and implementing plans that bring about new ways of defining their worlds. The theory describes a learning process that is primarily" rational, analytical, and cognitive with inherent logic. Thus, transformative learning refers to transforming a problematic frame of reference to make it more dependable in our adult life by generating opinions and interpretations that are more justified. It is a structure of assumptions of new experiences defining our attitudes, establishing our view of world, and guiding our actions (Mezirow, 1991). To lead the process, there was the following seven-stage sequence (1. A disorientating dilemma 2. Self-examination of affect (guilt, shame, etc.) 3. Critical assessment of assumptions 4. Exploration of new roles 5. Planning a course of action 6. Acquiring knowledge and skills for implementation 7. Trying out new roles). Use this sequence directly, or with its framework in mind, to help create the best outcomes for a period of fundamental re-visioning (Mezirow, 1997).

Critical reflective dialogue is the process by which the individual tests the validity of or justification for these assumptions and becomes a negotiation with others to develop a consensual validation of the assumptions that make up the frame of reference (Mezirow, 1990). Critical reflective action is action based on the critical self-reflection of the previously held assumptions and is intended to integrate the resulting new set of assumptions. The perspective transformation explains how the meaning structures that adults have acquired over a lifetime become transformed. These meaning structures are frames of reference that based on the totality of individual's cultural and contextual experienced and that influence how they behave and interpret events (Cranton, 2006). Transformative learning occurs when individual change their frames of reference by critically reflecting on their assumptions and beliefs and consciously making and implementing plans that bring about new ways of defining their worlds. The theory describes a learning process that is primarily " rational, analytical, and cognitive with inherent logic". Transformation is a "fundamental change in one's personality involving (together) the resolution of a personal dilemma and the expansion of consciousness resulting in greater personality integration (Brookfield, 1990). The process of discernment is education. Discernment calls upon such extra rational sources as symbols, images, archetypes to assist in creating a personal vision as meaning of what it means to be human. The process of discernment is composed of the three activities of receptivity, recognition, and grieving. First, an individual must be receptive or open to receiving "alternative expressions of meaning," and then recognize that the message is authentic. Grieving, considered to be the most critical phase of discernment process, takes place when an individual realizes that old patterns or ways of perceiving are no longer relevant, moves to adopt or establish new ways, and finally, integrates old and new patterns (Boyd & Myers, 1988). The relational or connected transformative learning



suggest that individuals learn through relationships with others. Autonomy therefore seems to take a back seat. However, if we look at this carefully, we see that relational learning is a process by which individuals suspend judgment and struggle to understand other's frame of reference. The goal is to see holistically, not analytically. But we are still moving to the same place-individuals moving toward a better understanding of the self by engaging with others. It is interesting to note that one of the assumptions of humanism is that reality is defined by each person-a constructivist assumption (Taylor, 2009). From point of view to develop critical reflective dialogue, the suitable process is appreciative inquiry.

Appreciative inquiry is the cooperative search for the best in people, their organizations, and the world around them. It involves systematic discovery of what gives a system "life" when it is most effective and capable in economic, ecological, and human terms that strengthen a system's capacity to heighten positive potential. In appreciative inquiry, intervention gives way to imagination and innovation; instead of negative, criticism, and spiraling diagnosis there is discovery, dream, and design. Link this "positive change core" directly to any change agenda, and changes never thought possible are suddenly and democratically mobilized. The most important insight we have learned with appreciative inquiry to date is that human systems grow towards what they persistently ask questions about. The appreciative inquiry cycle can be as rapid and informal as a conversation with a friend or colleague, or as formal as an organization-wide process involving every stakeholder. While there is no formula for appreciative inquiry, most organization-change efforts flow through the 4-D Cycle consists of 1) discovery or appreciating 2) dream or envisioning impact 3) design or co-constructing 4) destiny or sustaining. Each appreciative inquiry process is homegrown—designed to meet the unique challenges of the organization and industry involved (Cooperrider &



Whitney, 2001). The cycle begins with discovery (appreciating what is), then goes on to dream (imagining what could be), which is followed by design (determining what should be), and then destiny (creating what will be). We examined the cases to look for the extent to which they followed this sequence of activities. The process of inquiry that perhaps most defines appreciative inquiry practice is the collection of "stories" from system members and other stakeholders about their best experiences. (Cooperrider & Srivastva, 1987; Cooperrider & Whitney, 2001; Cooperrider & Whitney , 2005). So, this study proposes appreciative critical reflection which blends appreciative inquiry and critical reflection together.

Figure 2. appreciative critical reflection process

Appreciative critical reflection process may be conceptualized from Brookfield (1990), Mezirow (1991), Cranton (2006), Cooperrider & Whitney (2001) and through the descriptions and questions contained the followings: descriptive, analytic and critical with the questions of what?, what if?, now what?, why? and how? to describe situation and general reaction with little attempt to uncover personal assumptions or beliefs about situation, to integrate meaningful reaction to situation based on assumptions or beliefs, feelings, and alternative perspectives or points of view, to uncover the root causes of knowledge, assumptions and beliefs, to discover new meaning and to suggest how this experience can impact and inform the future, to analyze the metaphor, to compare premise. The 4-D cycle begins with discovery (appreciating what is), then goes on to dream (imagining what could be), which is followed by design (determining what should be), and then destiny (creating what will be). We examined the cases to look for the extent to which they followed this sequence of activities. The process of inquiry that perhaps most defines appreciative inquiry practice is the collection of "stories" from system members and other stakeholders about their best experiences. The evolution of the 4-D model the final phase was called deliver. This was changed to destiny as the developers of AI experienced much more transformational change the less they tried to guide it. "What we discovered, quite honestly, was that momentum for change and long-term sustainability increase the more we abandoned "delivery" ideas of action planning, monitoring progress, and building implementation strategies". Appreciative critical reflection process is showed as figure 2.

The transformation takes place as a result of structural changes in the psyches of the individual and in the social structures of society. The personal and social transformations co-emerge and in their dyadic relationship transform simultaneously (Elias, 1997). The transformation involves a change in the interrelationship among the higher mental functions, particularly in form of perceptions that include a conceptual mind, as well as sensations that create a world through ideas, concepts, images, and more bodily ancient archetypes constellated as emotions. The social and the personal transformation (change in structures) co-emerge at the same time (Dirkx, Mezirow & Cranton, 2006). The transformation takes place on at least two levels, for the individual participants and for the social unit it takes place in, whether that relationship is with whom or things. One cannot transform without the other (Mezirow, 1997). This means that transformation in transformative learning occur in symbolic interaction with other. Critical reflection, a distinguishing characteristic of adult learning, refers to questioning the integrity of deeply held assumptions and beliefs based on prior experience. It is often prompted in multiple interpretations (King & Kathleen, 2005). A defining condition of being human is that we have to understand the meaning of our experience. For some, any uncritically assimilated explanation by authority figure will suffice. But in contemporary societies we must learn to make own interpretations rather than act on the purposes, judgments beliefs, and feelings of others (Swanson, 2010). Critical reflection as a tool in transformative learning develops autonomous thinking (Branden, 2001). So, appreciative critical reflection in transformative learning process is suitable for enhancing high secure self-esteem (respective, competence and self-worth) of undergraduate public health students.

Step 2, the observing in class and field training of public health students, faculty of public health, Mahidol university during 2015-2016 A.D. as showed in figure 3.



Figure 3. comprehensive field tr

For case studies, appreciative critical reflection in transformative learning process for enhancing high secure selfesteem, which involves respective, self-worthiness and competency as followed.

First case was a thalassemia woman, senior and 21 years old. The workload in comprehensive and care about grade made her work hard. She got sick due to unrest and the heat. She was admitted in the district hospital. The doctor wanted to refer to provincial hospital, because of her symptom need to see a specialist. She worried about the report got a bad rating. She did not trust the delegates with high self-confidence. Thus, she refused to admit at provincial hospital and said "It was not so serious. I have experienced of these symptoms. It was better to admit at district hospital than provincial hospital. I can talk to my group to finish the report. At provincial hospital, it is difficult to visit my friends". The dialog was conducted. At last, the student agreed to admit at the provincial hospital for 2 days. After that the student came to the field training and said "Thank you very much, teacher. I think sometimes I have too much self-confidence and fear for bad rating, not relax leads to have a bad health. It waist the time more than trust the colleague to do the report instead of me".

Second case was a woman, senior and 21 years old. In the comprehensive field training, there were many tasks to do with team. She was assigned as a chief but she was reluctant and stress on her role. When the teachers came to audit her team, she thought that a bad rating occurred due to her leading role. She determined to go out of the field training. When the teacher knew about that, the dialog was conducted. She said "I can't do anything. I am not able to be a leader. I want to drop this semester. I shall come back to study next year." The teacher reflected "Calm down, you just rest and don't think about anything. You don't blame yourself. Nobody blame you. Your friends in your team accept that it is difficult work in comprehensive field training but they want to go along with you to pass



this training. If you drop this semester, you will not catch up and graduate with your friends. When you walk through the storm, hold your head up high. At the end of the storm is the golden sky". So, she designed to continue the comprehensive field training and graduated. This is the quote that she posted on her face book "T've been through a crisis in my life many times. When I am in discourage stressful time, I had run out of the dark to find a solution to the problem in the wrong way. But, thanks to a good friend in my life gave way at any time to cope the problem. I gradually learn to live a happy, sober and conscious".

On consecutive year, the tool for appreciative critical reflection was an opened mind journal. The consecutive public students wrote their feelings, thoughts and references. How/why did it occurred. What should be done in the future? For instances, during the

mourning time when the king passed away, the students wrote their feelings:

"What's happen? Why does it occur? This event makes me burn out. Everything is empty and desperate, but life goes on. No one is above the nature. I will pass it although it is difficult." "I see the teacher looks at smart phone and the tear comes to the eyes. Oh no! I regret, all of Thai people regret. My whole body is creepy and numb. We will pass this time together."

#### Figure 4. students' journals

As mentioned above, we analyzed that the transformative learning process for enhancing authentic self-esteem of under graduate public health students comprised of a cycle of disoriented dilemma, proposed premise, inspiration, practice and appreciative critical reflection in each step (D-P-I-P with AC).as showed in figure 5.





Figure 5. appreciative critical reflection in transformative learning process of undergraduate public health students for enhancing high secure self-esteem

## CONCLUSION

A transformative learning process for enhancing high secure self-esteem of undergraduate public health students from this study consists of disoriented dilemma, proposed premise, inspiration, practice and appreciative critical reflection in each step (D-P-I-P with AC). The appreciative critical reflection is blended from appreciative what is?, Imagining what could be?, Why did it occur?, How did it occur?, What is the premise?, Determining what should be?, What is the significance of your premise?, What did you learn about yourself and others?, Creating what will be?, What will you do as a result of this experience?, How will you use it to tell your future?. The more critical reflection relevant to daily life actions, the more effectiveness. The high secure self-esteem involves the factors of undergraduate public health students to be more respective, self-worthiness and competency. The transformative learning process changes the attitude of undergraduate public health students to be more respective, self-worthiness and competency. Thus, transformative learning process is effective for high self-esteem to prepare undergraduate public health students before going to the real world. However, the transformative learning process of our public health students is limited to context of Thai culture and society. In conclusion, enhancing self-esteem of public health students is important for social integration and participation after graduation. The process of transformative learning should emphasize on appreciative critical reflection and daily life acting on revision.



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## **Artifical Intelligence and Robots in Education**

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## ABSTRACT

The question of the role of robotics in education has been widely debated in both teaching and technology fields, with some schools already utilizing robots in the classroom for individual requirements. Furthermore, the issue recently caught fire when Bill Gates, billionaire, and entrepreneur, showed a determination to invest in specialized education programs based on machine learning. Amongst the hype, however, a real significance of such endeavor nor a security of deep learning's systematic nature seldom rises. This paper addresses the issue of the future role of artificial intelligence with a particular focus on whether artificial intelligence will change the traditional classroom scene. Also, this article will be looking at interactive artificial intelligence to show benefits and limitations of these systems, with certainty the field of education is one of the many spheres of human life that will face the biggest changes via the machine learning technology.

#### INTRODUCTION

On April 2017, Google launched a prestigious tool called AutoDraw. The name is pretty much self-explanatory. Using a broad database of drawn images, AutoDraw scans the scribble on screen and provides a list of images that the user supposedly meant to illustrate. Of course, artificial intelligence and deep learning technology are not new; in fact, it has never been new at least in the 21st century since it has been decades since artificial neural networks and their prototypes were introduced to the world- in the era of the digital revolution we reside in. A short search on the internet informs you that much of technologies and gadgets that had once been fantasy are becoming a reality. Self-driving cars, navigating drones, and smart phone gadgets that lead a conversation are no longer fiction. However, Google's AutoDraw brings us to a somewhat unsettling chapter of technological progression: that artificial intelligence has now the ability to 'correct' humans. If provided a bigger, more substantial database, computers would have the capacity to suggest to, inform, and guide. In other words, artificial intelligence would now be able to educate human beings.

It is not surprising that deep learning and artificial intelligence, among other technologies, would replace people in a majority of jobs. After all, the fundamentals of deep learning resemble that of a functioning brain: data and algorithms layered like neural tissues to learn, suffice, and think independently. The similarity between deep learning and the human brain is what allows Siri to manage our calendars and computers to trade our stocks. What's different is that computers are much less prone to mistakes: with the right data, the chances that computers will fail to answer a question correctly is very slim. Over the past decade of rapid progression, scientists and the public alike had to admit that computers are now more intelligent than humans: they make fewer mistakes, are more informative, and even learn considerably faster than any human being. Therefore, who could assert that artificial intelligence is not qualified to take the mantle of a teacher?

While the utility of artificial intelligence in some fields are under harsh skepticism, AI is already animatedly partaking in the sphere of education. In 2014, Google already launched Classroom, a program in which computers help teachers post class announcements, assign work, and grade assignments. ETS has successfully utilized artificial intelligence as a replacement of SAT and GRE essay graders. While these achievements are astonishing as they are, the more recent developments that strive to graft education and artificial intelligence aim much higher than mere grading systems or teacher's assistants. In 2016, Microsoft's co-founder and chairman Bill Gates has announced that the Bill and Melinda Gates Foundation has invested a sum of \$240 million into what is called "personalized learning." Unlike an orthodox -but astonishingly inefficient- model of a classroom, a personalized learning

programmed powered by artificial intelligence would have the ability to cater to each pupil's individual needs and circumstances. The AI pioneer Marvin Minsky's description of the technology vividly illustrates how wholly a computer program would partake in educating a human being: "...we could try to build a personalized teaching machine that would adapt itself to someone's particular circumstances, difficulties, and needs. The system would carry out a conversation with you, to help you understand a problem or achieve some goal...It would assist you by telling you what to read, stepping you through solutions, and teaching you about the subject in other ways it found to be effective for you" (Lane, C., Grover, S., & Roschelle, J. 2014). Bill Gates explains that personalize learning is based on the core the fact that people progress at a different rate. If a substantial database of data and algorithms were to be constructed, artificial intelligence would indeed garner the ability to be on the same page as each student: a feat that, human-led education systems have very seldom accomplished.

The function of an AI program as a teacher is not omniscient, of course. Primarily, deep learning only allows the deduction of answers, and mostly is incapable of specifically illustrating the process of the deduction, nor the correlation between questions and answers: just put, AI critically lacks in insightful cognition. The same cause makes it seem impossible for an AI too, despite its intelligence, show wisdom in fields such as philosophy and art. The economic gap between pupils that hinder some from getting access to learned computers is another factor. Bill Gates himself had admitted that the progress of personalized learning is "in early stages" and the satisfactory outcome will emerge "in five years, ten years from now, will it be highly penetrated? That's not clear" (Newton, C. 2016). However, the rewards from overcoming the obstacles are colossal. While the development of AI in education will not make humans irrelevant, a strong artificial intelligence is anticipated to eradicate a form of education in which individual needs are overridden by a totalitarian progress of learning. Perhaps the prestige personalized learning by artificial intelligence is receiving itself is in itself a backlash against the orthodox "assembly line" form of education that has dominated classrooms for far too long.

## **TECHNOLOGY: DEEP LEARNING MODEL**

Deep learning, or stacked neural networks, is a substantial part of artificial intelligence, is the technology of creating a computational human brain. To achieve this, multiple algorithms are intertwined and designed into neural combinations, with a prime goal of pattern conception, as seen in Figure 1. The network attempts to simulate the construction of a human neural network found in the human brain. A well-structured neural network is capable of 'clustering and classifying' data. Furthermore, through enough data circulation, or 'training,' the neural network may develop abstract concepts that allow it to adapt to a wide variety of circumstances.



Figure 1.

Retrieved from: https://hackernoon.com/log-analytics-with-deep-learning-and-machine-learning-20a1891ff70e As mentioned, deep learning is another term for 'stacked neural networks,' or systems that consist of several layers. The layers are formed from nodes, a computation tool that does what the neuron does in the human brain: recognize and transmit stimuli. Furthermore, a node is responsible for weighing the stimuli's value, assigning significance to the input data.



In a deep learning model, multiple layers – including the input, the hidden, and the output layers – formed with nodes coexist and work together to achieve the convoluted process of pattern recognition. In a network, each layer trains on different features based on the function. This setting is called a feature hierarchy, or a hierarchy of increasing intricacy and abstraction. A more complete the hierarchy is, the 'deeper' the neural network may understand data. After it is programmed, a neural network undergoes multiple training and tests, in which the layers process various data and develop not only intelligence but also intuition and comprehensive classification of information. Therefore, a substantial database and training may shape a neural network that indeed parallels the human brain in intellect.

#### IMPLICATIONS FOR EDUCATION

The core scientific goal of Artificial Intelligence in education is to "make computationally precise and explicit forms of educational, psychological and social knowledge which are often left implicit." (Self, J. 1999) The use of deep learning models combined with adaptive learning environments will help educators and learners better understand the implicit nature of learning. For example, artificial intelligence can assist educators and learners illustrate the incremental steps that takes place in the learning of any subject or the misconceptions that may hinder learning. (Vanlehn, et.al. 2005)

An example of a system illustrating the blending of AI and education is the AIEd system in Figure 2. (Luckin, R.et.al. 2016)

#### 1. ADAPTIVE LEARNING ENVIRONMENTS

A digital learning environment that adapts teaching and learning approaches and materials to the capabilities and needs of individual learners. (Luckin, R.et.al. 2016)

#### 2. MODELS

These represent something from the real world in a computer system or process, to assist calculations and predictions.

(Luckin, R.et.al. 2016)

According to its creators, the AIEd system that is designed to provide appropriate individualized feedback to a student. This is achieved by starting with three models, the pedagogical model which represents effective approaches to teaching, the domain model which represents the subject being learned, and the learner model which represents the student. Data and information from these models are processed by algorithms and fed into an interface. The interface may be computer screen, robot, or any instrument that interacts with the student. The content is adaptive which means that the content is individually tailored to the learner. The data and results from the adaptive content is first captured and then inputted into a deep learning model (Data Analysis in figure 2). Given enough data, the Deep learning model will be able to determine what adjustments should be made in the learning process. (Luckin, R.et.al. 2016)





Figure 2.

Retrieved from: https://www.pearson.com/content/dam/corporate/global/pearson-dot-com/files/innovation/Intelligence-Unleashed-Publication.pdf

## 3. LEARNER INTERFACE

Whether the interaction between the learner be in the form of a computer screen, mobile phone or a robot, the interface between the learner and the adaptive content must be focused on improving the learning process and not focused on just the technical aspects. Concentrating just on these technical aspects does not automatically promote better and faster learning. Having the incorrect type of interface could actually be detrimental to the learning process. (Koper, R. 2014) Therefore, the design of any interface, for example that of a robot, would be a factor in how effective the overall process should be. In addition to the design, the process by which humans learn as shown in Figure 3 below is another factor to be considered in the system. (Koper, R. 2014)





Figure 3.

The modal model of the architecture of human information processing (adapted from Ashcraft and Radvansk [2010] p.38)

#### 4. ADVANTAGES AND DISADVANTAGES

It takes several years to train an effective human teacher or tutor. In addition, it costs financial resources to train such instructors. However, once a AI system is programed with significant efficiency in teaching a subject, that program can be digitally reproduced within a matter of seconds without any more cost than the memory space on a hard drive. The expertise and skill will be ingrained in the AI system and can be updated with new data and information almost instantly and simultaneously. The AI system will not be subject to the vicissitudes of human existence nor the inevitable individual emotional states that affect teaching. The AI system will, furthermore, be available anytime and at anyplace.

The AI industry and AI programming are still in its infancy, and still its cottage industry stage of development. There are individuals working on programs and systems and conduct experiments with prototypes. However, this state is usually the furthest point of development as large commercial interests have not taken up the mantel and invested into the necessary steps for development of a truly efficient application. Therefore, there is currently no central or overarching control mechanism to coordinate or collaborate different stakeholders and participants. (Luckin, R.et.al. 2016)

#### **5. ROLE OF TEACHERS**

As the role of AI systems increases in education, teachers will need to develop new skills

According to the creators of the AIEd system teachers will specifically need:

1. An ability to make value judgments on AI products which would enable them to evaluate AI products based on their knowledge and understanding of AI technology.

2. To develop research skills regarding AI and be able to interpret data and use that data to help learners obtain information more efficiently.

3. An ability to utilize AI assistants and incorporate them into to work with human assistants.

4. An ability to manage AI resources effectively. (Luckin, R.et.al. 2016)

#### CONCLUSION

Based on the research that the development of the deep learning technology and artificial intelligence in the past decade has been astonishing, scholars assert that a complete satisfactory amalgam of artificial intelligence and the



field of education will take place in a matter of years. The adaptation of artificial intelligence in the school system holds great prestige, for it would grant the possibility of an education system in which nobody is left behind. Scientists hope that the natural flexibility of the deep learning technology that allows omnipresence will be able to cater to students worldwide, with the substantial supervision of large data. On the other hand, further development in the future will have to take place under sturdy values and morals, for the power that education holds in the shaping of young minds are incredibly substantial.

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Figure 1. Retrieved from:

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# Autonomy for Digital Natives: A Pedagogical Consideration of a Blended Learning Model in Efl Classrooms for Fostering Learner Autonomy

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## ABSTRACT

This study aims to investigate the impact of a blended learning model for fostering learner autonomy in EFL university conversation classrooms. Based on needs analysis and learner perspectives on previous existing blended learning models, blended learning model for fostering learner autonomy was developed and implemented. This teaching and learning model for blended learning included learner training for learning strategies, setting goals and objectives, self-evaluation, etc. Using various multimedia and mobile-enhanced resources, it allowed freedom in choosing CMC and multimedia tools based on the learner preferences based on their needs and goals.

## INTRODUCTION

Learner autonomy also referred to as self-directed learning, self-planning learning, independent learning, etc., indicate the ability for learners to become responsible for their own learning through making independent choices (Asuman, 2010; Azer, 2008; Kim, 2013; Little, 1991). While the role and significance of learner autonomy itself and the roles of teachers and learners in fostering learner autonomy have been a few of the hotly debated issues in FLT/L, it is generally accepted that learner autonomy needs to be promoted in L2 learners in EFL (English as a Foreign Language) classrooms. Previous research agree that learners must take place in learning as active participants who can manage their learning, and number of research have explored the significant of learner autonomy (Cotterall, 2000; Garrison, 1997; Thanasoulas, 2000). Learner autonomy, however, is not a simple concept as it is composed of assorted features including learners' cognitive strategies, metacognitive strategies, attitude, motivation, and beliefs to name a few (Thanasoulas, 2000).

While it is generally agreed that fostering learner autonomy is beneficial to L2 learners, what needs to be considered is how go about fostering it. It seems that learner autonomy is fostered in learning environment where learners can use both cognitive and metacognitive learning strategies, develop sense of independence, and interact with others where they can gain exposure to peer's ideas and gain approval for their own (Candy, 1991; Thanasoulas, 2000). It seems that blended learning, with its capacity to provide both online and offline learning environment with diverse multimedia tools and learning styles may serve to suit the varying needs and conditions of L2 learners in fostering learner autonomy. Blended learning models specifically developed for EFL purposes have proven to be effective and learners have received them positively (Yoon, 2016). Therefore, in this study, effectiveness and learner perspectives on blended learning model for enhancing learner autonomy are investigated to suggest ways to fortify and better implement blended learning model in L2 classrooms and promote learner autonomy.

## THE STUDY

This study aims to investigate the learner perspectives on learner autonomy and preference in multimedia tools and contents to suggest ways to strengthen promotion of learner autonomy through blended learning model in EFL university conversation classes. The research questions for the study are specified as follows:

- 1) What is the effectiveness of blended learning model for learner autonomy on EFL learners?
- 2) Are there significant differences between blended learning model and blended learning model that fosters learner autonomy?

The subject for the mixed study consists of 130 university students in a university in South Korea, taking a course on English conversation. This 2-credit hour course was as a graduation requirement and 2 sessions were offered for 15 weeks for the study. The participants were placed in the course based on the school-wide placement test using TOEIC, and the average score for the participants at the time of placement were 310 out of 999, indicating that they were beginners. Both sessions were taught in English by the researcher and the control group consisted of 67 participants, and the experiment group consisted of 63, totaling in 130 participants.

For the experiment, Blended Learning for Learner autonomy (BL-LAS) model was used to foster learner autonomy in blended learning environment. For the control group, blended learning model (Yoon, 2011) was used. The difference in the two model is that for BL-LAS, elements of learner autonomy are maximized, which are the addition of learner autonomy training and allowance for learner choices in choosing multimedia learning tools and contents for self-regulated learning, cooperative learning, and self-assessment and short-term goal setting (Yoon, 2016).



## FIGURE 1

Blended Learning for Learner Autonomy in L2 Speaking (BL-LAS) Model (Yoon, 2016)

Data sources for the study includes the pre-and post-test scores and questionnaire. The tests were conducted in forms of voice recordings which students submitted via email on week 2 and week 14. The scoring rubric was developed using Brown's (2004) oral proficiency scoring categories and Test of Spoken English scoring guidelines (Educational Testing Service, 1995). The rubric consisted of items on regarding accuracy on grammar and segmental features of pronunciation, and fluency on content, flow, and suprasegmental features of pronunciation. The tests were scored by the researcher and a native speaker professor in English department. The interrater reliability shows the Cronbach's alpha value was .93 showing very high reliability.

The questionnaire was designed based on previous researches by Hwang's (2011), Sharle and Szabó (2000), and Tassinari (2012). It consisted of four scale Likert-type scale for questions on learner perspectives on the blended learning model and learner autonomy, and multiple response questions for learner preference for multimedia tools and contents. The questionnaire was conducted on week 15, and all 130 participants completed and turned in the questionnaire.
#### FINDINGS

The scores of pretest and posttest are presented in Table 1. The scores were analyzed for accuracy and fluency where accuracy was scored out of 20 and fluency was out of 30, totaling in 50. The total mean for the pretest was 33.85 out of 50 and the post test was 40.24, showing an increase of 6.392 points. The students' score on accuracy was 14.38 for the pretest and 16.76 for the posttest, and the score for fluency was 19.77 for the pretest and 23.72 for the posttest, showing 2.337 points and 3.946 points of increase, respectively. There were significant increases found in the scores from pretest to posttest in all, showing that appropriate blending of online and offline resources and learning activities had positive effects in L2 speaking ability of the Korean university students who participated in this study.

Items		Mean	N	SD	t	df	p	
Total	Pre-test	33.85	130	5.323	10 50 4	129		
	Post-test	40.24	130	3.797	-19.704		.000	
Accuracy	Pre-test	14.38	130	2.287	2.287		000	
	Post-test	16.76	130	1.751	-14.312	129	.000	
Fluency	Pre-test	19.77	130	2.966	17.669	100	000	
	Post-test	23.72	130	2.293	-17.008	129	.000	

Table 1 Scores from Pretest and Posttest

In Table 2, scores from control and experiment groups are presented. There is a significant difference in the scores of the post-test in all three items, total, accuracy, and fluency between control and experiment groups. Data shows that there is no significant difference in the scores of the pre-test between the groups for all three items, showing that there no difference at the onset of the study. However, for the post-test, the experiment groups did significantly better than the control groups in all three items investigated. The total score for the control group was 38.94 and the experiment group was 41.62, showing a difference of 2.68 points. For accuracy, the experiment group's mean score was 17.63, which was 1.69 point higher than the control group with 15.94. And the significant different was found for fluency as well where the experiment group had 34.48 points which was 1.48 points higher than the control group with 23.00 points. In the whole, the experiment group's post-test score significantly higher than the control group's scores, showing that BL-LAS was more effective in increasing Korean EFL learners' speaking skills.

Items		C/E	N	Mean	SD	t	df	p
Total	Pre-test	Control	67	33.21	5.938	1 412	100	202
		Experiment	63	34.52	4.529	-1.415	128	.282
	Post-test	Control	67	38.94	3.958	4 292	100	046
		Experiment	63	41.62	3.091	-4.282	128	.040
	Pre-test	Control	67	14.37	2.341	050	128	680
		Experiment	63	14.40	2.274	039		.089
Accuracy	Post-test	Control	67	15.94	1.757	( )92	120	009
		Experiment	63	17.63	1.261	-0.285	128	.008
Fluency	Pre-test	Control	67	19.43	3.134	1 220	100	121
		Experiment	63	20.13	2.756	-1.556	128	.151
	Post-test	Control	67	23.00	2.418	2.960	129	047
		Experiment	63	24.48	1.891	-3.800	120	.04 /

Table 2. Scores of Experiment and Control Groups



## CONCLUSIONS

Based on the findings, it was found that blended learning is effective in teaching and learning L2 speaking in EFL environment for Korean university students in this study. Both blended learning models employed in the study consisted of 7 features and components of blended learning identified by Yoon (2011), 1) Pedagogical instruction and learning experience, 2) individual work, 3) interaction with peer, 4) interaction with teacher, 5) feedback, 6) discussion and reflection, and 7) multimedia component, and both models were found to be effective regarding speaking accuracy and fluency. Moreover, BL-LAS model, which was a modified model for fostering learner autonomy was found to be significantly more effective in improving EFL learner's accuracy and fluency in speaking. It seems that blended learning that foster learner autonomy can bring about significantly more positive impact on EFL students, and further study in learner perspectives on BL-LAS is recommended to investigate how learners perceive the elements of learner autonomy. In addition, whether BL-LAS has indeed fostered learner autonomy in EFL students based on field study is suggested.

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# **Basic Educational Teacher-Administrator Interpersonal Behaviours Under the Office Educational Commission in Thailand**

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## ABSTRACT

Comparatively speaking, the performance of Thai administrators in international studies of Thailand's relatively weak human resource base has been pinpointed as one of the underlying factors in the cause of the economic and financial crisis that has hit the country over recent years very poor. This research reports on a study that investigated the role that Thai administrators' interpersonal relationships with their teachers play in enhancing the teachers' teaching plan and students' achievement in the subject and in forming or changing the teachers' attitudes to teaching arrangement. The questionnaires were administered to a sample of 716 teachers in 80 schools under the Office of Basic Education Commission (OBEC) throughout of Thailand. Administratorteacher interactions were assessed with the 48-item Questionnaire on Administrator Interaction (QAI) which was adapted version from the *Questionnaire on Teacher Interaction* (QTI) (Wubbles & Levy, 1993). This questionnaire has an Actual and Preferred Forms. Teachers' attitudes were assessed with the Test of Administrator-Related Attitudes (TOARA) which was based on the Test of Science-Related Attitudes (TOSRA) (Fraser, 1981). Statistically significant differences were found between the teachers' perceptions of actual and preferred administrator interpersonal behaviours. It was found that administrator interpersonal behaviour was high on factors such as Leadership, Helping/Friendly, Understanding and Teacher Responsibility/Freedom behaviour, while factors such as Uncertain, Dissatisfied, Admonishing, and Strict behaviours were far less prominent. Significant differences were found between teachers' perceptions of actual and preferred administrator interpersonal behaviours, and a typology comparison of teachers' perceptions of Thai administrators could be classified as Authoritative in both the actual and preferred administrators' interpersonal behaviours. Associations between teachers' perceptions of their administrators' interpersonal behaviour with their attitudes to their school administration were found. The multiple correlations were significant for the Actual Form of the QAI and the TOARA, 39% of the variance in teacher's attitude to their schools was attributable to their perceptions. Based on the findings, suggestions for determining and effecting the school administrations by school's administrator interpersonal behaviour for improving sustainable educational development in school's administration in Thailand with teachers' perceptions are provided.

## BACKGROUND

Thailand's relatively weak human resource base has been pinpointed as one of the underlying factors in the cause of the economic and financial crisis that has hit the country over recent years. Many have highlighted the lack of Thai graduates capable of independent analytical thought as one factor responsible for the country's economic downfall. The fact of the crisis has brought home the need for a thorough re-examination of the country's human resource development system and set the stage for across-the-board reform of Thai education. Recognizing the urgent need for education reform, the government, acting through the Office of the National Education Commission (ONEC) under the Prime Minister's Office, has formulated policies and plans to bring about necessary changes within the Thai system. The National Education Act is the country's master legislation on education which will provide the framework for education reforms: learning reform, administrative reform, reform in learning and teaching, learners as the Center of Learning, and teachers as agents of learning reform.

Regarding the **Ministry of Education**, the 1999 National Education Act and its 2002 Amendment as well as the 2003 Act for Streamlining of Ministries and Governmental Agencies mandate the amalgamation of the 3 ministries and agency responsible for education, namely, Ministry of Education, Ministry of University Affairs, and Office of the National Education Commission into a single Ministry of Education with a new administrative structure. The need for school reform can be explained in both international and national contexts. Internationally, societies are changing from industrial to information-based societies in which the creation and dissemination of knowledge play critical roles in industrial to information-based societies in which the creation



and dissemination of knowledge play critical roles in both individual and social development. However, that school reform does not simply happen within a classroom, but the whole system, within which education takes places, needs to change. Subsequently, the key elements for successful reform at the state, school and classroom levels are introduced. Inefficient management and administration of the education system, inequity of access to quality education, inadequately qualified teachers, and a rigid learning environment are identified as prime causes for the failure to address the private sector's human resource needs.

To successful implement school reform in Thailand, a number of key areas must be addressed including the approaches to learning and curriculum reforms, professionalization of teachers, appropriate assessment, use of technology, and considering unique Thai cultural aspects, especially, professionalization of Administrators. The professionalization of administrators requires the establishment of systematic support mechanisms including administrators licensing and administrator incentive schemes. Quality assurance of educational institutions is also an important tool for changing the way administrating is conducted by focusing on educational outputs consistent with schooling reform administrations.

Administrators in school district central offices oversee public schools under their jurisdiction. This group includes those who direct subject-area programs, supervise instructional coordinators and curriculum specialists, and work with them to evaluate curriculums and teaching techniques and improve them. Administrators also may oversee career counseling programs and testing that measures students' abilities and helps to place them in appropriate classes. With site-based management, administrators have transferred primary responsibility for many of these programs to the principals, assistant principals, teachers, instructional coordinators, and other staff in the schools.

Focusing on administrators, unlike teachers, work a twelve-month year and are fairly busy most of that time. Whether running a small, private day-care center or an overcrowded public high school, an administrator's tasks are many and various, ranging from curriculum development to student discipline. The most familiar school administrator is the principal. Any one of these administrators may be responsible for infrastructure maintenance, the hiring and training of teachers, and student affairs.

International research efforts over the last 30 years have firmly established classroom environment as a thriving field of study (Fraser, 1994). Recent classroom environment research has the teacher-student interactions that occur in the classroom (Wubbels & Levy, 1993). This study was to improve, adapt, and describe the determinants and effects of the actual and preferred of teachers' perceptions to extend this notion in order to obtain more comprehensive picture of administrator interpersonal behaviour within educational service area in school educational base environments in Thailand.

This study discusses the school environment instrument selected for use in this research. The rationale for the selection of the *Questionnaire on Administrator Interaction* (QAI) is followed by a discussion of the climate of school environments including how administrating is one of unique features of educational reform with in school environment and therefore, the selection of the *Test Of Administration-Related Attitude* (TOARA). Because teachers' perceptions of school environment have been favourably associated with teacher's attitude to school's administration, it was decided to select an appropriate measure of teachers' attitudes.





*Figure.1.* Leary model of interpersonal behaviour (Wubbels, Creton, Levy & Hooymayers, 1993, p.15) and Model for administrator interpersonal behaviour characteristics (Wubbels, 1993).



### USING THE SCHOOL ENVIRONMENT INSTRUMENTS

In the last decade, many countries have used learning environment instruments in conducting research studies. In addition to a form, which measures perceptions of actual environment, the instruments have an additional form, which measures preferred environment. The preferred form is concerned with goals and value orientations as it measures perceptions of the environment ideally liked or preferred. Although item wording is almost identical for actual and preferred forms, the directions for answering the two forms instruct student clearly as to whether they are rating what their class is actually like or what they would preferred it to be like.

#### The Questionnaire on Administrator Interaction (QAI)

The Questionnaire on Administrator Interaction (QAI) was adapted version from the Questionnaire on Teacher Interaction (QTI). Historically, the QTI, classroom environment research grew out of the studies of Moos and Walberg in the late 1960s and early 1970s. Since then, a number of instruments have been developed with which it is possible to conduct research focusing on the classroom environment. Wubbels, Creton and Hoomayers (1985) focused on the teacher variable for improving the learning environment, and developed a model to map administrator interpersonal behaviour. It was based on the model for interpersonal behaviour of Leary (1957). Wubbels et al. (1985) adapted the Leary model and developed a model for interpersonal teacher behaviours. They mapped the behaviours of teacher with a proximity dimension (Cooperation, C - Opposition, O) and an influence dimension (Dominance, D - Submission, S). These dimensions can be represented in a coordinate system divided into eight equal sections as shown in Figure 1. Each sector of the diagram represented the following typical interpersonal behaviours of the teacher: *Leadership, Helping/Friendly, Understanding, Student Responsibility/ Freedom, Uncertain, Dissatisfied, Admonishing,* and *Strict* behaviours. The Leary model of the two original dimensions of *dominance-submission* and *hostility-affection* was used in clinical psychology and psychology settings to describe interpersonal behavior. Leary used the model for developing a checklist of directly observable interaction to be called the *Interpersonal Adjective Checklist* (ICL) that had 128 items.

The QTI, which measures students' perceptions of teacher interpersonal behaviour, is based on this model (Wubbels & Levy, 1993). The Australia version of the QTI containing 48 items was used in studies involving science classes in Western Australia and Tasmania. The Thai version was translated of the QAI containing 48 items that it was intended this shorter Australian version would be used and adapted measures teachers' perceptions of administrator interpersonal behaviour of the typical interpersonal behaviours of administrator into *Leadership, Helping/Friendly, Understanding, Teacher Responsibility/ Freedom, Certain, Satisfied, Monishing,* and *Strict* behaviours in this study.

The 16 categories of interpersonal behaviour developed by Leary were later reduced to eight categories (Wubbels, Creton, Levy, & Hooymayers, 1993). These eight can be presented in a two-dimensional system as represented in Figure 1(b).

Wubbels (1993) further divided each of the four quadrants of the Leary model into two sections, making a total of eight (Figure 1-b). The sections in the model for interpersonal administrator behaviours are labeled DC, CD, CS, SC, SO, OS, OD and DO according to their position in the coordinate x-y system. These behavioural aspects were labeled respectively *Leadership, Helping/Friendly, Understanding, Student Responsibility and Freedom, Uncertain, Dissatisfied, Admonishing* and *Strict* Behaviours. Characteristics of these behaviours appear in the sections of Figure 1.

#### **RESEARCH AIMS**

- 1. To assess comparisons between the teachers' perceptions of their actual and preferred administrator interpersonal behaviours to their administrations under the Office of Basic Education Commission in school's administration environments in Thailand?
- 2. To assess associations between teachers' perceptions of their administrators' interpersonal behaviours under the Office of Basic Education Commission in school's administration environments in Thailand?



## **RESERCH PROCEDUES**

#### **Research Instruments**

In addition to the main questionnaires QAI, and the Test of Administration-Related Attitudes (TOARA), this adapted version from the Test of Science-Related Attitudes (TOSRA) (Fraser, 1981a). The TOARA questionnaire was selected to use with the aim of investigating any possible relationships with teachers' perceptions about their administrator's interpersonal behaviour in administrations in the basic education of school's administration environments. The TOARA consists of eight scales.

## Sample

The main study involved the teachers who are teaching at the schooling educational base of the office of The Basic Education Schools under the Office of Basic Education Commission (OBEC) of Thailand. The study was conducted at 40 school environments. Overall, data were collected using the Thai versions of the QAI, and TOARA from a sample of 716 teachers in The Basic Education Schools under the Office of Basic Education Commission (OBEC) throughout in Thailand.

## RESULTS

## Validation and Reliability of the QAI and the TOARA

The results given in Table 1 shows that on average item means for each of the eight QAI scales, that they contain six items, score from 0 to 4, so that the minimum and maximum score possible on each of these scales is 0 and 24, respectively. Because of this difference in the number of items in the eight scales, the average item mean for each scale was calculated so that there is a fair basis for comparison between different scales. These means were used as a basis for constructing the simplified plots of significant differences between forms of the QAI shown in Figure 1. For the remaining eight scales, *Leadership, Helping/Friendly, Understanding, Teacher Responsibility/Freedom, Certainty, Satisfied, Monishing* and *Strict* behaviours, there were significant differences between students' perceptions of their actual and preferred teachers' interpersonal behaviour.

Table 1.

Scale	Form	Scale	Scale Std.	Alpha	Discrim.	Mean	<i>t</i> -test	ANOVA
		Mean	Dev.	Reliability	Validity	Differ.		$(Eta^2)$
Leadership	Actual	18.86	3.45	0.80	0.41	2.37*	16.43*	0.15*
	Preferred	21.59	2.54	0.74	0.59			
Helping/Friendly	Actual	18.16	3.99	0.77	0.48	2.94*	29.29*	0.90*
	Preferred	21.10	2.70	0.73	0.56			
Understanding	Actual	18.67	3.50	0.81	0.40	2.64*	15.90*	0.13*
	Preferred	21.31	2.72	0.76	0.52			
Teacher	Actual	17.62	3.59	0.71	0.43	3.00*	28.15*	0.84*
Responsibility/	Preferred	20.62	2.76	0.78	0.60			
Freedom								
Certainty	Actual	16.31	4.14	0.82	0.41	4.68*	25.31*	0.18*
	Preferred	20.99	3.58	0.74	0.59			
Satisfied	Actual	16.04	4.40	0.72	0.33	3.97*	65.86*	0.79*
	Preferred	20.01	3.15	0.77	0.52			
Monishing	Actual	15.71	3.99	0.76	0.42	5.17*	28.55*	0.18*
	Preferred	20.88	2.95	0.73	0.61			
Strict	Actual	16.41	3.68	0.71	0.49	3.43*	35.39*	0.89*
	Preferred	19.84	2.85	0.79	0.46			

Scale Internal Consistency (Cronbach Alpha Reliability) and Ability to Differentiate Between Classrooms (ANOVA) for the QAI.

\* Correlation is significant at the 0.001 level (2-tailed)



The internal consistency reliability of the version QAI used in this study was determined by calculating Cronbach alpha coefficient for the 48 items of the QTI using both actual and preferred teachers' perceptions scores. Table 1 reports the internal consistency of the QAI, which ranged from 0.71 to 0.82 when using the teachers' actual scores and from 0.73 to 0.79 when using the teachers' preferred scores.

This characteristic was explored using a series of one-way analyses of variance on the scales of the QAI, which suggests that each scale of the QAI was able to differentiate significantly (p < 0.001) between teachers' perceptions in actual and preferred school administration environments by the administrator in the same school; environments. The *eta*<sup>2</sup> statistic which is the ratio of "between" to "total" sums of squares and represents the proportion of variance in scale scores accounted for class by membership, ranged from 0.13 to 0.90 for different scales.

In term of the TOARA, internal consistency (Cronbach alpha coefficient) was obtained for the sample in this present study as indices of scale reliability is 0.74.

# Comparison of teachers' perceptions of their actual and preferred administrator interpersonal behaviours in the basic school administration environments in Thailand

On comparing differences between the teachers' perceptions of their actual and preferred administrator interpersonal behaviour in basic school administration environments in Figure 1, it was found that teachers' preferred perceptions an environment with upper levels of *Leadership, Helping/Friendly Understanding, Teacher Responsibility/ Freedom Certainty, Satisfied, Monishing,* and *Strict* behaviours than teachers' actual perceptions.

It is clear from a comparison of the preferred people for Thai administrators with the actual that Thai administrators would preferred their teachers to be friendlier, more understanding, more teacher responsibility and freedom, and demonstrate leadership behaviours. They would also prefer their administrators to be more admonishing, satisfied, certain, and strict behaviours.



*Figure 3.* Simplified plot of significant differences between teachers' perceptions of their actual and preferred scores of the QAI.



# Associations between teachers' perceptions of their administrators' interpersonal behaviour in school administration environments and their attitudes toward school administration:

The simple correlation values (r) are reported in Table 2 which show significant correlations (p<0.01) between teachers' attitudinal outcomes and administrators' interpersonal behaviour on all of eight scales. These associations are positive for the scales of *Leadership*, *Helping/Friendly*, *Understanding*, *Certain*, *Monishing*, *Satisfied* and *Strict*. That is, in school administration environment where the administrators perceived greater leadership, helping/friendly and understanding behaviours in their teachers, there was a more favourable attitude towards their school administration environment.

The second type of analysis consisted of the more conservative standardized regression coefficient ( $\beta$ ) which measures the association between teachers' perceptions on each scale of the QAI and their attitudes towards school administration when the effect of relationships between the scales is controlled.

The multiple correlation R is significant for Actual Forms of the QAI and shows that when the scales are considered together there is a significant (p<0.001) association with the TOARA. The  $R^2$  value indicates that 39% of the variance in teacher's attitude to their school administration environment was attributable to their perceptions of their administrators' interpersonal behaviour. The beta weights ( $\beta$ ) show that in school administration environments where the administrators perceived greater leadership, helping/friendly, understanding, teacher responsibility/freedom, certain, monishing, satisfied and strict behaviours in their administrators, there was a more favorable attitude towards their school administration environments.

Table 2

Associations between QTI Scales and Attitudes to Physics Classes in Terms of Simple and Multiple Correlations (R) and Standardized Regression Coefficient ( $\beta$ )

	Simple Correlation	Standardized Regression Weight			
Scale	Attitude (r)	Attitude ( $\beta$ )			
Leadership	0.25*	0.21*			
Helping/Friendly	0.27*	0.20*			
Understanding	0.26*	0.21*			
	0.20	0.21			
Teacher Responsibility/Freedom	0.22*	0.30*			
Uncertain	0.25*	0.31*			
Dispetiafied	0.22*	0.22*			
Dissaustied	0.55*	0.52			
Admonishing	0.26*	0.21*			
Strict	0.21*	0.26*			
M Will Constation (D)					
Multiple Correlation (K)	0.63*				
$\mathbf{R}^2$		0.05			
	0 39*				

n = 716, \*p < 0.05, \*\*p < 0.01



#### CONCLUSIONS

In this study, appropriate statistical procedures were used in order to follow the two research aims, regarding the validation of the questionnaires. The procedures included Cronbach alpha coefficient, discriminant validity; compare means (*t*-test) and one-way ANOVA. The two instruments, namely, the Questionnaire on Teacher Interaction (QAI), and the Test Of Administration-Related Attitude (TOARA), are valid and reliable for use in schools of the office of the base educational service in Thailand.

Overall, Thai base educational service area of schools' administrators show relatively favourable perceptions of their school administration environments. However, the actual and preferred perceptions of 716 teachers of their administrators' interpersonal behaviour in school administration environments were measured with the QAI. The comparisons of the Actual Form with the Preferred Form indicated that administrators' roles would prefer more leadership, helping/friendly and understanding, certain, satisfied, monishing and strict behaviours in their administrators in school administration environments tended to be greater than what they actually perceive to be provided.

This study is very important because it is one of only a handful of studies in the field of school administration environments in Thailand, and it represents one of only a few studies worldwide that has focused on the school administration environment at the office of educational service area in Thailand.. This study is significant in that, by translating, field-testing, refining, validating, and using the two modified versions of the QAI and the TOARA. Overall, the findings of the present study have made several distinctive contributions to the field of school administration environments that were studies to be carried out in Thailand.

# IMPLICATIONS FOR IMPROVING SCHOOL ADMINIDTRATION ENVIRONEMNTS FOR SUSTAINABLE EDUCATIONAL DEVELOPMENT

This study still has several tentative implications for school's administrators, and educational researchers in Thailand. Two generally applicable instruments were used: the Questionnaire on Administrator Interaction (QAI), and the Test Of Administration-Related Attitude (TOARA), and were found valid and reliable for use in Thailand's schools. The availability of these instruments provides a means by which teachers' perceptions can be monitored for administrators to attempt to improve their administration roles; To successful implement school reform in Thailand, a number of key areas must be addressed including the approaches to learning and curriculum reforms, appropriate assessment, use of technology, and considering unique Thai cultural aspects, especially, professionalization of Administrators.

Based on the findings, suggestions for improving the school environment are needed. Administrators have to give administrations' roles which promote school cohesion, give teachers practical activities related to what students learn in school classes, give ideas related to teachers' prior knowledge, previews to connect to future school environments, make a clearly organizational plan for advising, and vary the rate of delivery where appropriate. Administrators should change and use more effective body movements and gestures, introduce a stated organization of school administration environments, give sufficient variety in supporting information, promote higher order thinking, and should give feedback that is informative and incorporates teachers' and students' responses, or provider of outlines and handout of the reader roles of school's administrator.

Although Thailand's administrator interpersonal behaviours were perceived by teachers as favourable, evidence from research on administrator-teacher relationships indicated widely differing teachers' perceptions of their actual and preferred administrator interpersonal behaviors in school administration environments. Teachers preferred their administrators to exhibit more positive leadership, helping/friendly, and understanding, and student responsibility/freedom, certainty, satisfied, monishing and strict behaviours. However, the administrators' interpersonal behaviours showed a gap between the actual and preferred administrators' interpersonal behaviours measured. Therefore, it is important for school's administrators to improve their interpersonal behaviour towards teachers so that this gap between teachers' actual and preferred administrator interpersonal behaviour will decrease. Thus, school's administrators should develop the reader roles of administrating activities in school environments that will enable them to exhibit more cooperatives to achieve behaviours and less oppositional ones.



## SUGGESTIONS FOR TOMORROW RESEARCH IN THAILAND

School environment research in Thailand is one of the reforms the Thai government has been providing in accordance with the Ninth National Education Development Plan (2002-2006). Most of the administrators who are administrating in primary and secondary education, must improve their administrating by using the findings of school administration environment research. This present study is one of the first school administration environment research. This present study is one of the first school administrator in Thailand involving two separate measures, the Questionnaire on Administrator Interaction (QAI), as well as the Test Of Administration-Related Attitude (TOARA). These instruments have been shown to be reliable and valid for use in future studies in Thailand. By using these instruments, a number of school administration environment research directions can be pursued in Thailand.

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# Best Practices in Teaching Values Education to Gifted High School Students

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## ABSTRACT

This paper aims at identifying the teaching strategies and methods that are considered as best practices in teaching values to gifted high school students. Using the theory of teaching modes, the study intends to classify which of these teaching modes apply in teaching the gifted. Based on the student-respondents' answers to a school-year ender evaluation in Values Education class and on the character formation program report of various campuses in a high school for the gifted, results show that there are several teaching strategies and methods such as games, interactive class presentations and projects, community service, and film showings that refer to learning through action and experience mode. Some students also identified direct teaching and teaching through dialogue and discussion modes as effective ways of teaching since values, being abstract concepts, need to be explicitly taught. There are few teaching methods that are characteristic of learning by enquiry and thus may point to a need for more teacher training on this. Other teaching strategies do not necessarily fall into any of the categories but are remarkable to this study, i.e., the importance of stimulating the intellectual operations characteristic of the gifted and the ethical environment that has to be cultivated in the classroom itself.

## INTRODUCTION

Teaching gifted students can be a challenging task for teachers since their learning ability far surpasses those of the average students. One of the definitions of giftedness was offered by Renzulli in his three-ring concept of giftedness that consists of above-average ability, task commitment, and creativity (Colangelo & Davis, 1997). Gifted individuals then have higher intellectual capacity, more persistent in doing tasks, and are more creative in their thinking. Delisle and Lewis (2003) described gifted learners as those who can memorize facts and concepts quickly and thus can get bored, daydream, or disturb others; can communicate ideas well which can be a show off, or monopolize discussions that may provoke resentment among their classmates; are curious about practically everything; and, can be assertive and stubborn in their opinions.

Teaching gifted students Values Education, i.e., education in virtues and character, is even more a daunting job, since their moral reasoning is also more advanced than other students (Davis & Rimm, 2011). In a study of Karnes and Brown in 1981, gifted students can already reach the post conventional level in Kohlberg's model of moral development- comprises the recognition of universal moral principles as valid and can be basis of right action- in their high school years, which is reached by only a small percentage of adults. Gifted students have a strong sense of justice, moral principles, and individual rights. Because of their advanced cognition and sense of justice, they tend to have more advanced capacities for moral reasoning (Berkowitz & Hoppe, 2009). At the same time, gifted students tend to aspire to make a positive impact on society (Davis & Rimm, 2011).

For many schools, the Values Education, Moral Education, or Character Education is part of the curriculum that addresses the moral development of the students. In the study of Lakshmi (2014), values education is referred to as a process of teaching and learning about the ideals of a society that aims not only for understanding the values, but also reflecting them in students' attitudes and behaviors, promoting good citizenship and ethical practice, thus contributing to the society. Moral education, at least for Plato, has as its goal to bring the seats of human motivation, i.e. the desire to know and understand by the reason, the ambition for achievement and honor by the spirit, and the longing for satisfaction by the appetite, into an intelligent harmony (Ryan & Bolin, 1999). Character education programs, meanwhile, seek to uphold moral and ethical growth (Davis & Rimm, 2011) or are concerned about acquiring integrity (Ryan & Bolin, 1999). Elkind and Sweet (2004) adapted Dr. Thomas Lickona's description of character education as the well-intended effort of making persons understand, have concern for, and behave according to the core ethical values. In summary, all of these types of values curricula point to the character development and human fluorishing of the students.



At the same time, Renzulli posited that "the strategies that are used to develop giftedness in young people should give as much attention to the co-cognitive conditions of development..." (Davis & Rimm, 2011, p. 269). It is the aim of this paper, therefore, to explore and present best practices- "techniques and methods that seem to be more effective at helping to deliver a desired outcome" (Callard-Szulgit, 2010, p. 22)- in this case, inculcating values, those which can be considered co-cognitive conditions of development, among this type of students. As such, these practices can aid the gifted students in achieving their aspiration of making a potent difference to the society at present and in the future.

## THE STUDY

"...The teaching profession at the present time needs a simple and flexible classification of teaching that is both theoretically powerful and practically useful." (Skinner, 2010, p. 23). Hence, Skinner presented the theory of teaching modes and identified four modes of teaching and learning as direct teaching, teaching through dialogue and discussion, learning through action and experience, and learning through enquiry. Firstly, the direct teaching mode has the basic feature of directly presenting the ideas and skills to the students. The students learn by "attending to and absorbing critically the direct presentation of ideas, skills, and information" (p. 35). Secondly, the teaching through dialogue and discussion mode highlights classroom interaction in the form of conversations, question and answer sessions, and various forms of open discussion. Given the clarity of educational aims for this mode, students learn through interaction of ideas among each other. Thirdly, the learning through action and experience or active learning mode is characterized by engaging and challenging children's thinking skills using real-life instances, or is plainly learning by doing. Lastly, the learning through enquiry with its different types such as problem solving, experiments, etc. and learning outcomes, emphasizes the questioning process for the students to arrive at or discover concepts by themselves. Effective teaching, then, is having mastery of each mode.

Does this theory of teaching modes apply to teaching the gifted? For teaching Values Education to gifted high school students, which of these modes of teaching are employed and considered to be effective to produce the desired outcome of understanding and applying values? What are examples of strategies, activities, and projects that serve as best practices for better teaching and effective learning?

This study focused on the case of the Philippine Science High School (PSHS), the premier science high school of the country, that is mandated to provide an education that is "humanistic in spirit, global in perspective and patriotic in orientation" (www.pshs.edu.ph) to it scholars who passed the national competitive exam and bested around 24,000 applicants every year. These scholars have high aptitude in math and the sciences and thus considered to be gifted in the country. The vision of the Philippine Science High School for its scholars is to have a scientific mind and a passion for excellence, dedicated to the service of country and committed to the pursuit of truth. A number of scholars have given recognition to the Philippines through their remarkable achievements in different international contests and research competitions. Furthermore, many graduates are dedicated to public service, emphasizing their generous contribution to the country. To date, the Philippine Science High School System is comprised of 14 campuses nationwide.

The PSHS has started the 6-year high school curriculum to respond to the K-12 educational program promulgated by the Philippine government recently. While Values Education may be treated in three levels: classroom, school, and community that interact with one another (DeNobile & Hogan, 2014), the Values Education (VE) of PSHS is being offered as a course or subject in the foundational years (Grades 7 and 8) in the current 3-tier or 6-year high school curriculum and thus, is limited to or focused on the classroom level. In its course syllabi, VE I for Grade 7 students has the course title "Foundation of Values" which emphasizes on human nature as an integral component to attaining virtues for good character. On the other hand, VE II for Grade 8 students have the course title "Foundation of Human Action" which offers a set of ethical standards governing the universal moral values that serve as framework in analyzing issues confronting adolescents today. It emphasizes on the impact of personal choices and the consequences of one's actions to self, others, and

society. The content or curriculum of VE, however, is outside of the scope of the study, since the focus is on teaching or instruction of the course.

In identifying the best practices in teaching VE, 2 main sources of information were utilized: 1) the open-ended survey among 48 respondents of Grade 8 students and 2) some documents of the PSHS System i.e., of the different campuses as regards best practices in character formation entitled as "Best Practices in Encouraging Good Manners and Inculcating Good Values in the Students". The survey was conducted among Grade 8 students of the researcher as part of an optional class evaluation upon finishing the academic year of 2016-17 in the PSHS Main Campus, situated in Manila, the first campus to be built. These 48 students comprised most of the 2 classes who responded to the survey. The questions were direct in asking what best practices, i.e. strategies and methods were applied in Value Education classes that helped them learn the subject matter, and the reasons for their answers. Meanwhile, the data that were submitted by the representative of each PSHS campus to a technical working committee that studied the character formation efforts done in the PSHS System, were culled according to the objective of this study, i.e. the practices being done in the Value Education classes. More information about the practices was added by the researcher who teaches the same course in order to concretize and enrich the findings of the study.

### FINDINGS

The answers of the students on the survey or evaluation questions were varied. Each respondent identified 1-3 teaching strategies, methods, or activities. But among the best practices enumerated individually by these 48 student-respondents, playing games was one of the top 2 answers. For those who learn better with games, 9 of the total respondents, they claimed that they get energized and light-hearted, especially if the games are done as an introduction to a discussion. Students realized that values become memorable and can be applied to games and in real life. Thus, games provide an indirect chance to practise the values. One respondent claimed that since values are a serious matter, he was encouraged to practise them and not just to learn about them because of these fun games. Also, with the implementation of games, teaching becomes more interactive and stimulates creative thinking. Some of the games played in the VE classes involved solving puzzles, playing game boards such as Taboo, Pictionary, and even 4 Pics 1 Word. These claims can well support the play-based lerning as discussed by Farber (2015) in his book "Gamify Your Classroom." Games and playing are considered to be supplement to learning that at times can be serious. Adapting Piaget's thoughts, games symbolize a method to integrate information and to acquire cultural norms. For Vygotsky, games naturally prepare children to life as adults, especially if they point to regulate behavior. The rules applied to the games in the classroom indeed serve to educate the students in the rules of life. With mainly the interactive component of games, one can deduce the aspect of learning through action and experience as the mode of teaching gifted high school students can benefit from. As one of the respondents claimed, it is ultimately learning by doing.

Other answers of the students in the survey also reflected a mode of learning through action and experience. These answers were, among others, hands-on activities (4 answers), interactive presentations or class projects (4 answers), learning from experience and applying them/learning then doing it (2 answers), and real-life examples (2 answers). The main reasons for these methods or activities were supportive of the adage: the more senses are engaged, the better learning there will be. A remarkable reason also given was that these activities stimulate creative thinking, a characteristic of the gifted. In real-life examples, on the other hand, students get to identify with role models. With these methods and activities, teachers then are recommended to teach interactively, to make students work together, teach one another and be more involved in their own education and their classmates' as well (Bauer, Benkstein, Pittel, & Koury, n.d.).

Various strategies among the regional campuses of the PSHS System pointed to the mode of learning through action and experience. For instance, the VE classes in the West Visayas Campus highlighted its "Love Jam" which is a concert that aims to promote the principle of real love that waits, commits, and endures (Ocampo, 2016). Meanwhile, the CALABARZON Campus has its "Television Project" that engages the students to create a story that features specific human values shown in 12 colorful and creative television slides (Laurena, 2016). It also has its "ISAGAWA" (To Apply in One's Thoughts, Words, and Deeds), a 3-minute infomercial done by

students that teaches the value of human dignity by fostering social grace and community building. Moreover, the report of the Main Campus listed the Alternative Classroom Learning Experiences-ACLE, an annuallyorganized activity of the VE classes, as a way to inculcate values among the students (Briones, 2016). ACLE is a set of activities that offers various learning workshops on different interests such as calligraphy, cooking, photography, theatre, dancing, etc. that students can attend and participate in as they discover the various virtues that can be deduced from these workshops. All these methods reflect the idea that since values are comprehended in an abstract way, they have to be understood and practised through experience. As Ryan and Bolin (1999) put it, character involves thinking, feeling, and doing.

Very much part of the mode of learning through action and experience is the outreach project/community service that was deemed as best practice by at least one of the respondents and by teachers who prepared the character formation activities done in various campuses of PSHS. In the West Visayas Campus, service learning is done to a select public elementary school whereby scholars are divided into teams of 5 and each team is assigned to take care of a group of public school children for 3 to 4 hours. In this activity, the gifted high school students are provided the opportunity to share stories, lessons in different fields of interests, conduct games, songs and team building sessions. The Television Project of the CALABARZON Campus also has its outreach component as the students present these "slides" of values to the children of a nearby Day Care Center. In the Main Campus, each of the VE classes goes out of the campus to visit orphanages and hospitals in order to play and read stories with the children in these institutions. These outreach projects put a strong emphasis on opportunities to serve others. Service learning is very much at the heart of character education. Community service is a form of altruism that helps communities and aids in building self-concept among students. More importantly, students learn about the desirability of values that relate to caring for others. (Davis & Rimm, 2011). In relating with others in these outreach projects, students are helped to empathize with others, to get out of their own world, and to practise to behave in an ethical and altruistic manner (Ryan & Bolin, 1999). Moreover, for gifted children who are characterized to be altruistic and assertive, service learning is precisely providing them the opportunity to learn by serving others and to exercise their leadership and be empowered, which are features of effective character education (Berkowitz & Hoppe, 2009).

Another best practice that topped the answers of the student-respondents, together with games, was film showing. For those who preferred film showings in class (9 out of the 48 respondents), the main reason was that those students considered themselves as visual learners, i.e., they can easily remember the scenes and the values these portray as they picture them in their mind. Aside from catching their attention, movies provide fun, enjoyment and entertainment while learning. Some examples of movie shown in the classes were The Emperors' Club, Gifted Hands, Fireproof, Pelle, Children of Heaven, Akeelah and the Bee, and Sully. Apart from the reason that the students gave, Wright (2013), commenting on the book "Reel Character Education: A Cinematic Approach to Character Development" by Russell and Waters, indicated in her article that films indeed have an important role of inciting meaningful discussions on social matters, personal beliefs, and moral questions. Films can be a potent teaching method, particularly for the young people, to help them develop character and make positive decisions. Film showing as a teaching method, however, may not be a mode of learning through action and experience per se. But, it may be considered as learning through vicarious experience; i.e., learning through the experiences of others.

On the other hand, a number of respondents referred to examples of direct teaching and teaching through dialogue and discussion as effective modes of learning. Specific answers were "full dictation", "discussions", "thorough analysis of morality", "teaching the consequences of not having the value", and "giving importance to happiness to improve ourselves". The reasons given were mainly to learn the concepts and understand them fully. In teaching values then, explanations about them are needed in order to enhance the students' understanding (Ryan & Bolin, 1999). There is a need to explicitly teach values so students know what the values mean and how the values are lived (Broadbent & Boyle, 2013). Explanations include among others, the definition and importance of that value. And, in discussing universal values, it is a good practice to base them on the impact of one's behavior upon others (Davis & Rimm, 2011). These explanations spur on to dialogue and discourse between teachers and students, and among students as well.

Based on the answers of the student-respondents, there seemed to be no element of learning through enquiry that is considered remarkable as a mode of teaching. One campus, however, reported an assessment tool being used in the VE classes which may have the feature of this mode. Such assessment tool aims to elicit relevant concepts and ideas students learn from the lessons (Laurena, 2016). The students are challenged to explore the lessons in values by formulating essential questions and try to respond to the same questions that are relevant to their lives. Meanwhile, the report of the Main Campus highlighted journal writing in VE as a best practice in the character formation of the students (Briones, 2016). It can be a mode of learning through enquiry since the students are usually asked questions to answer and write in their journal: "What positive thing did I do today? What negative thing did I do today? What can I do tomorrow to be a better peron?" Such questions may also aid in enhancing the reflective thinking of the students. As Lovat (2005) claimed, students have to be engaged in other skills such as self-reflection which is basically the knowledge that comes from knowing one's self and that provides the basis for one's moral principles. Since among the teaching modes, learning through enquiry requires the teacher's recognition of range of types of enquiry, and varying structures and processes (Skinner, 2010), its application in teaching VE may need more training on the part of the teachers.

Some of the answers of the student-respondents which they considered best practices in teaching values may not fall in any of the teaching modes and yet they are remarkable to this study since they can point to the intellectual operations of the gifted. Strategies such as storytelling (2 answers) and making acronyms, puns or concept associations (3 answers) can be an application of Guilford's system of intellectual operations in the gifted. He enumerated them: cognitive memory, convergent thinking, divergent thinking, and evaluation as the dimensions of his thinking skills model (Gallagher & Gallagher, 1994). Gifted students appreciated storytelling since it allows them to exercise their cognitive memory as regards the what, where, and how of a story and at the same time practise the evaluation dimension as they try to extract the values from that story and apply them in other situations. Biographical stories, fictional and non-fictional anecdotes comprise most of the storytelling sessions in the VE classes. As claimed by Hopkinson (2008), in addition to the qualities of heroes, other elements in myths and fairytales relate lessons on values. These stories help students find meaning in their life, learn about various values, and aid in one's decision-making and personal development. Making acronyms, puns and word associations in the classroom, on the other hand, are aids to learning and can be manifestation of analogous thinking, that capacity to draw analogies, to identify associations between ideas or even to link two different concepts or events together (Gallagher & Gallagher, 1994). For instance, a class activity was done where students were asked to make a traffic sign- a concept, and incorporate the value of patience -another concept- to it. One output of students made use of the traffic sign STOP and continued with the tagline for patience: "Learn how to wait."

Another interesting finding of this study among a considerable number of the student-respondents (10 out of 48 of them) referred not exactly to the way of teaching but in the ethos or the environment in the classroom. A number of respondents pointed to patience, compassion, and respect for others as rather important in teaching VE. Others answered: "being morally good and clean" (as also monitored outside the classroom), "humility", "expressing good qualities to one another", "open-minded", "following the unspoken rule"-as supposed to refer to the basic rules of good manners and right conduct. These may be reflective of the values in action or values experienced in the classroom itself that make it conducive to learning values. Students can learn and adopt the values more if there is already an atmosphere of values in the classroom, a certain ethical environment (Ryan & Bolin, 1999). The students claimed that learning and experiencing these values help one to improve one' personality and character, to succeed in life, to live a joyful and satisfying life and that benefit practically everyone. This result is supportive of the study on the impact of values education on student health and wellbeing and that positive education leads to the intellectual, social, emotional, and moral growth of the person (Broadbent & Boyle, 2013). To further analyze this result, one can say that it falls on the responsibility of the teacher to create this ethical environment in the classroom (Ryan & Bolin, 1999). Teachers have this key role in cultivating and maintaining, among others: respect and compassion, and that the "unspoken rule" should always be followed.



The above findings can be reinforced by more researches on this topic and with participation of more students, including Values Education teachers, in gathering relevant data. Also, best practices in teaching values that are yet to be implemented in the VE classes of the PSHS campuses can be explored. Furthermore, a separate research can study Values Education not just as a subject in class but more so, as a form of a school-wide campaign for character development. Lastly, other modes of teaching or theories of learning specific for the gifted can be used as a conceptual framework of future studies.

## CONCLUSION

Among the modes of teaching for effective learning, strategies and activities that refer to learning through action and experience are considered as best practices in teaching values to gifted high school students. Examples of which are games, hands-on and interactive cass presentations, and even film showings. Remarkable among these activities are the outreach projects or community service that develops the caring values among the gifted students and empowers them to help others and thus exhibit altruism which is very characteristic of the gifted. Moreover, a number of the students pointed to the modes of direct teaching and teaching through dialogue and discussion which provide them opportunity to understand and analyze the abstract ideas presented to them. Besides, researches show that there is a need to explicitly teach the values, what they are and how they are lived. With regard to learning through enquiry, few manifestations of these in the VE classes demand that this mode be made more familiar with the teachers through trainings and workshops. In summary, the class discussions in the article of Elkind and Sweet (2004) featured in www.goodcharacter.com has put it indeed succinctly: "The best forms of character education [or values education] also involve students in honest, thoughtful discussion and reflection regarding the moral implications of what they see around them, what they are told, and what they personally do and experience."

There are strategies and activities, moreover, that may not fall into the four modes of teaching and yet considered to be best practices or aids to effective learning because they addressed the thinking operations described of the gifted such as the operations of creative thinking and evaluation.

Another remarkable result of this study is having an ethical environment in the classroom, i.e. students realized the presence of the values in the classroom as the proper occasion and opportunity for understanding and application of the values themselves thus promoting student moral well-being. In the end, as Berkowitz and Hoppe (2009) explained it well: "Good character [or values] education is good education... and that good character [values] education is also good gifted education" (p. 140).

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# **Blockchain Technology and the Fintech Revolution**

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## ABSTRACT

The question of the role of Blockchain Technology, a decentralized and distributed digital ledger, in the Financial Services Market is only now being addressed with the technology in its infancy. Subsequent work primarily focused on the cryptocurrency, bitcoin, because its creator, programmer Satoshi Nakamoto first published a white paper and coded what is now known as blockchain technology to solve the double spending problem. More recently, Blockchain Technology has made significant advances in the fields of insurance, medical records, and the internet of things (IoT). However, the power of Blockchain Technology to solve problems in and serve as a replacement ledger of transactions in Financial Services will fundamentally transform the finance industry. This paper attempts to address the challenges that Blockchain Technology will encounter by focusing on the methodology of using Blockchain Technology to solve problems in the Financial Services Market with special attention to the use of Decentralization and Peer-to-Peer Transactions. Specifically, this project will be examining the use of Blockchain Technology to drive the changes in the field of Financial Services. This paper will also discuss the future role of Blockchain Technology in teaching the various fields of Finance, and juxtapose them against traditional teaching methods in Finance, in order to reveal the increasing role that Blockchain Technology will play in the 21st-century Financial Services curriculum. This paper argues that indeed, Blockchain Technology will be able to increasingly affect how we solve various Financial Services problems and that this development will profoundly change the way the Finance curriculum is taught in the classroom. In conclusion, this project, by closely examining the role of Blockchain Technology, sheds new light on the rapidly developing changes in the Financial Services field.

## **INTRODUCTION**

Since the sub-prime crash in the financial market in 2008, the stability of the orthodox financial system had been consistently questioned. Upon research, numerous limitations of the current system structure, from the addition of cost and fees to the vulnerability to fraud and crime, has arisen to the attention of financial stakeholders. The Harvard Business Review had reported that "45% of financial intermediaries, such as payment networks, stock exchanges, and money transfer services, suffer from economic crime every year; the number is 37% for the entire economy, and only 20% and 27% for the professional services and technology sectors, respectively" (Tapscott et. al. 2017). The Review asserts that the cause of such inefficiency is mainly due to the financial system's antique and vulnerable nature, that makes it resistant to both change and attacks that may lead to hacking or system failure. The assertion that the system is too exclusionary, denying usage to a sizable population of billions, has also been raised. Due to the many flaws, a revolution in the sphere of national and global finance has been long sought for. Many believe that the innovative combination between the modern technology and finance – thus the fintech revolution - signaled by none other than the rise of blockchain technology, will become the milestone key to solving the issue of the unstable financial model.





Figure 1. (Retrieved from: http://blockchain.open.ac.uk/)

According to the Wharton School of the University of Pennsylvania, blockchain is "a distributed database of computers that maintains records and manages transactions" (Knowledge @ Wharton, 2016). Unlike the orthodox financial system that is based upon a central authority -most commonly a bank- blockchain utilizes "blocks" to record transactions in the permanent database. The blocks, that may contain and record anything that may be of value, from money to equities, bonds, titles, deeds, and contracts, are then linked to each other in the form of a chain in linear, chronological order. A graphic illustration of this concept may be seen in Figure 1 above.

Furthermore, instead of storing all the information in one central database, blockchain is distributed across all computers around the world that are connected to its network clients: an advantage over any other financial model that make it nearly impossible to be hacked, for an attack would have to include accessing every copy of the database simultaneously to succeed. Wharton School eagerly reports that "The ability of the (blockchain) technology to provide an unforgeable record of identity, including the history of an individual's transactions, is one are being eagerly explored." The graphic in Figure 2 below illustrates the difference between the traditional methods of recording a transaction on a ledger and the blockchain method of recording a transaction. In the traditional method (illustrated on the right) the transaction record is kept by the clearing house in one location. This makes it vulnerable to attack and hacking because any attack must only breach the security of the clearing house. In a blockchain, however, the ledger is kept by multiple parties to the blockchain. Therefore, any attack must breach the security of multiple keepers of the ledger, an almost impossible task. The blockchain, then, provides a much more secure method of keeping a ledger.



In contrast to today's networks, distributed ledgers eliminate the need for central authorities to certify ownership and clear transactions. They can be open, verifying anonymous actors in the network, or they can be closed and require actors in the network to be already identified. The best known existing use for the distributed ledger is the cryptocurrency Bitcoin

FT graphic. Source: Santander InnoVentures, Oliver Wyman & Anthemis Partners

Figure 2.



While the rise of blockchain technology is to some, extremely new and even unheard of, the first adaptations of it in financial sectors have made almost a decade ago. The evolution of blockchain technology has been gradually spotted since the design of bitcoin and the bitcoin database by an unknown programmer -or programmers- Satoshi Nakamoto. Through the development of bitcoin using blockchain technology, Satoshi Nakamoto found a way to eradicate the double-spending problem, or an error in digital money trade in which the same token -currency of value- is spent more than one time as a result to the duplication and defiling of digital files. The development of a secure digital currency therefore became possible, but the technology itself had to undergo a growing infancy. The number of centers that exchanged bitcoins to cash were sufficiently limited, and the technology itself had been quite for a long time shunned for its unconventional nature and some concerns about its future prospect. Bitcoin had also many times been tangled up with criminal activities in the black market and the deep web, for the discreet transaction of money it allowed spurred many of users with criminal intent to implement the technology for purchase and trade of drugs, firearms, and pornography. Consequently, the bubbles and bursts of bitcoin's value has continued since the genesis of is utility in 2008, as the arrows have both skyrocketed and plummeted down.

However, the growing need in the global financial market over the past decade has indeed been good to the technology in the long run. According to the Wall Street Journal, bitcoin is now "starting to look slightly more stable than gold" (Yang, 2016). The value of blockchain technology itself has also substantially grown. The Harvard Business Review reports that "in 2016 blockchain companies raised \$400 million from traditional venture investors and nearly \$200 million through what we call initial coin offerings". Blockchain is already stretching out its influence into fields other than financial service, for tech companies, software behemoths, and financial giants such as Microsoft and IBM are also eager to invest in its future. A report by the Wharton School quotes the senior vice president of IBM Research: "I want to extend banking to the 3.2 billion people who are going to come into the middle class over the next 15 years...So I need a much lower cost of keeping a ledger. Blockchain offers some intriguing possibilities there". Upon debating its possible applications in the future, the Forbes reported that "One group of big tech and finance companies has combined forces in the Open Ledger Project to create a wide range of different blockchain-style projects for different specialized needs, ranging from conventional supply chain management to basic administrative tasks like exchange of car titles. Some schools are even using blockchain to record students' grades and share academic certificates. And of course, there is always talk of tax being collected via blockchain at some point in the future" (Harpaz, J. 2016). Like so, much light being shone over the blockchain technology and its applications in the future is because of the enhanced speed of transaction and more efficient services it provides, along with its abilities to be applied into almost any sphere of life. It seems that perhaps the information driven era has finally met its financial companion.

## FINDINGS

It would be very easy to examine the definition of blockchain without truly understanding the ramifications of this new technology because the definition is after all, benign. The blockchain technically is a just digital ledger. One would be forgiven if one were to contemplate on such a question as: "how can a digital ledger bring about a "Revolution" in the financial industry?" To answer this question, one must examine the ramifications of this ledger and how it will change not only the financial sector but also every other industry that involves transactions.

The simple answer is Trust. For the first time in modern history, blockchain ensures "trust" among the parties to a transaction. For example, when a buyer purchases a product on Amazon, it is Amazon who ensures that the buyer will pay and who ensures that the seller will deliver the product under the traditional definition of online transaction. People purchase products on Amazon because they can reasonably assume their transaction will be completed. It is trust that allows the transaction to take place. However, with the blockchain, Amazon will be cut out of the transaction. Indeed, any 3rd party agent that plays the role of ensuring trust between the parties to the transaction will no longer be needed. The blockchain is a peer to peer application. In other words, the buyer and the seller deal with each other directly. There is no third party to the transaction. The Harvard Business Review describes this transaction as following: "Instead a series of intermediaries act as guarantors of assets as the record of the transaction traverses organizations and the ledgers are individually updated.



In a blockchain system, the ledger is replicated in a large number of identical databases, each hosted and maintained by an interested party. When changes are entered in one copy, all the other copies are simultaneously updated. So as transactions occur, records of the value and assets exchanged are permanently entered in all ledgers." (Iansiti, M. 2017) The ensuring or "trust" in the transaction is provided by the blockchain ledger. The transaction will be digitally recorded in the ledger and this record will be permanent. Anyone who wants to exam the transaction may do so.

The ramification of Trust is enormous because there will be no need for 3rd party agents. Bitcoin fans have been enthralled by this idea, dubbing it "the libertarian ideal of a pure, digital currency beyond the reach of any central bank." The economist commented that "The real innovation is not the digital coins themselves, but the trust machine that mints them—and which promises much more besides." (The Economist, 2015) The business sector themselves are aware that this ramification might engender a disruption to the existing economy. Accordingly, many financial institutes are conducting research on how this will impact their business practices. After all the biggest 3rd party agents in society are financial institutions.

Ramification number 2 is Chain of Custody. Chain of Custody ensures that whatever product that is registered on the blockchain is the genuine product and not a replica or reproduction. For example, imagine that an artist creates a sculpture. There is a digital passport that can be embedded into the work. This digital passport number is then registered onto the blockchain. Once registered, the artist will have a permanent and irrevocable chain of custody record. Anyone who wants to purchase that sculpture will now be able to track the chain of custody of that work from the time it leaves the artist hands until the time it arrives in the hands of the purchaser. The ramification is that the blockchain can ensure that any product is the genuine item. The blockchain may be able to eliminate fraudulent and knockoff products. This is not limited to just works of art. Any product's genuineness can be ensured, whether it be coffee, hand bags, clothes, or diamonds.

In real life, online P2P lodging services like AirBnB incorporates the blockchain for the very reason- the Chain of Custody. Companies like AirBnB provide a platform that enables individual home owners rent their rooms to other individuals. For systems like this, safety and credibility is easily the biggest concern. In order to ensure a level of security and credibility, the lodgings and the hosts are each given unique ID numbers, used similarly as the aforementioned digital passport. Because this ID represents the specific person or the specific lodging, it cannot be tampered with or duplicated even if the users delete their accounts and make a new one. The Goldman Sachs analyze such implementation of blockchain saying "By enabling a secure, tamper-proof system for managing digital credentials and reputation, we believe blockchain could help accelerate the adoption of P2P lodging." (Williams-Grut, O. 2016)

In sum, Blockchain does have the potential to "revolutionize" not only the financial industry but also many other industries because of these ramifications. Imagine a world where there is no need for bankers, real estate brokers, insurance agents, attorneys, or for an Amazon. Large corporations all over the world are acknowledging the potential of the Blockchain, and the extent to which the industry is growing is rather eye-opening. According to the Reuters, "American International Group Inc. (AIG.N) announced a blockchain-based insurance product. Bank of America, Citigroup, Goldman Sachs, Wells Fargo and other banks have invested in blockchain startups, and many will roll out commercial blockchain products [in 2017]. In the first quarter [of 2017], blockchain startups raised a total of \$141 million from investors, a 57 percent increase over the fourth quarter [...] according to data provider CB Insights." (Somerville, H. 2017) These trends are only beginning of blockchain disrupting the traditional financial systems.

It would be difficult to talk about blockchain without talking about "Bitcoin," because many people confuse the two and think that they are the same. They are not. Perhaps one should be forgiven to confuse the two since they are part of the parlance, and because the "inventor" of Bitcoin also created the idea of the blockchain. The blockchain technology has its beginnings with an unknown programmer -or programmers- using the nickname: Satoshi Nakamoto. Takemoto didn't invent crypto-currency. Crypto-currency had been around before. What Nakamoto did was he solved the double-spend problem.

Satoshi Nakamoto found a way to eradicate the double-spending problem or an error in digital money trade in which the same token -currency of value- is spent more than once. In other words, how can we prevent people from using the same crypto-currency twice? Nakamoto's solution to the double spending problem is illustrated in Figure 3. Nakamoto came up with the blockchain, a digital ledger that ensures trust and a chain of custody for the bitcoin. As a result, the bitcoin does not rely on a 3rd party and also has a chain of custody to ensure legitimacy.

# The Double Spending Problem



Figure 3

Due to this feature, bitcoin became renowned for its security and reliability as a token of exchange. All of the transactions made via bitcoin are marked into a new "block" every ten minutes. Also, according to Dr. Saifedean Ammous's research, "For somebody to 'hack' into the Bitcoin network and change the issuance schedule, they would be required to marshal processing power larger than 17,000 times the power of the world's top 500 supercomputers. Alternatively, more than half of the processing power behind the distributed Bitcoin network needs to vote to change the issuance protocol. Such a change is highly impractical, for several reasons."

But, one must ask: Couldn't we apply the concept of the blockchain ledger to other valuables? Like coffee, handbags, or anything sold on Amazon? What naturally should have been a "yes," was hampered by the fact that bitcoin gained something of a bad reputation.

## IMPLICATIONS FOR EDUCATION

According to D. Lavin at Edtech Strategies, the following may be methods in which blockchain technology may be utilized:

1. Records Keeping: Student transcript/degree/test score/record validation and transfer, including those associated with college admissions;

- 2. Educator credentialing/certification/re-certification;
- 3. Management and tracking of school property and assets;
- 4. Management of student privacy and parental records;
- 5. Distribution of federal/state programmatic funds or private grants;
- 6. Distribution and payment of student loans. (Levin, D. 2016)

Generally, any and all records kept by educational institutions can be kept on a blockchain ledger. The advantages of security, chain of custody, and transparency would be bestowed on the administrative actions of an educational institution. As the role of digital distributed ledgers systems increases in education, institutional administrators will need to develop new skills, such as an ability to make value judgments on AI products and digital ledgers, developing research skills regarding AI and blockchains, interpreting data and using them effectively in administrative tasks and record keeping, utilizing new technologies and training members of an administration on such technologies. (Luckin, R.et.al. 2016)



#### CONCLUSION

Blockchain technology provides enhanced speed for transactions and because it is so fluid in its application, it seems that finally the information driven era has finally met its financial companion. This digital ledger has promised the economy to ensure trust by eliminating the third party that has been seen as a necessity in current day transactions. Also, blockchain provides a Chain of Custody, which can prove a product is genuine and has not been replicated. It seems evident that the blockchain technology, often mentioned in relation to the crypto-currency "bitcoin," would be tangible evidence that digital decentralized ledgers are tangible.

Therefore, the evolving environment of Artificial Intelligence and blockchain requires a multidisciplinary approach. No longer can financers, educators, administrators just be satisfied with the traditional way of doing things. Future financiers and other stakeholders must first understand the challenges that these new technologies bring, including addressing the problem of bitcoin's reputation. To reach new frontiers of the blockchain technology, they must also search their own knowledge and expertise, and share their expertise and perspectives. Those who are able to adjust and adapt these technologies in their practice will be the ones will be leaders of finance and education.

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## **Can Artificial Intelligence Make Art?**

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### ABSTRACT

The question of whether artificial intelligence can create art has been widely debated in the art industry, with Professors of the Rhode Island School of Design such as Mark Milloff arguing that artificial intelligence cannot create art, and what may seem as their original work are mere "technological tricks." However, these opinions have not adequately addressed the recent advances in artificial intelligence and machine learning. This paper addresses the issue of artificial intelligence with particular attention to machine learning of creativity. Furthermore, by discovering the structure and compatibility of deep learning, this article will focus on the technology's possibilities in the various fields of art, which has long been strictly restricted to humans.

## **INTRODUCTION**

The words "can" and "may" are, despite their similar and sometimes mixed usage, particles that have entirely separate nuances. "Can" refers to the technical ability to be able to do or achieve something, while "may" is mainly used to denote permission – think about the difference in meaning between the phrases "can I go to the bathroom?" and "may I go to the bathroom?"

Can artificial intelligence create art? If it can, may it? These two questions, although similar, yield entirely different answers from its creators and the public alike. Plainly speaking, researchers of artificial intelligence have already given life to artificial neural networks that can create images that already surpass human manual ability. Although yet trivial, the tunes developed by an AI system are stunningly vivid and concurrent. Then, may artificial intelligence create art? The answer to this question is much more controversial, for it forces us to contemplate upon the very concept of art and humanity.

The rapid evolution in the field of artificial intelligence and machine learning had given birth to the eager application in the area of art as in any other spheres of life. In June 2016, Google launched Magenta, a crowd-sourced project that applies machine learning to different fields of art, including music and visual image while aiming to build a community of artists and researchers. By exposing to Magenta millions of training examples and gradually adjusting the parameters, the research team in Google allowed it to establish its very own imagery about random objects. Also, the application of algorithms also allowed random noise to inspire generate purely original and astonishing images, which, according to BBC News, were compared to "the art a human might create when they had taken mind-altering drugs such as LSD, others to the work of tortured genius Vincent Van Gogh" (Wakefield, 2015). Similar projects are being conducted on other spheres of art. "Sony CSL Research Laboratory is planning to release a whole album of songs written by artificial intelligence (Ward, 2017)" reports Culture Trip. The Sony AI system called Flow Machines "analyzes a database of songs and then creates compositions following a particular musical style."

While many technological adaptations of artificial intelligence in fields such as mechanical engineering, medicine, and lifestyle are accepted and even eagerly welcomed, the stretch of artificial intelligence into the sphere of art and creativity has met, on the contrary, harsh criticism. Jonathan Jones, an art critique of The Guardian, had mocked The New Rembrandt, a 3D painted Rembrandt painting by an AI program, as "an April Fool's joke", stating that it was "a horrible, tasteless, insensitive and soulless travesty of all that is creative in human nature" (Jones, 2016). Mark Milloff, a painter and art professor at the Rhode Island College of Design, denotes such attempts for AI to create art as "a technological trick" (Lee, 2016).

The resistance in the art industry against the application of AI to art seems to be primarily centered on the supposed core of creating art itself: human intent. The Oxford English Dictionary defines art as "The expression or application of human creative skills and imagination, typically in a visual form such as painting or sculpture, producing works to be appreciated primarily for their beauty or emotional power" (Results for "Art," English Dictionary, Oxford Living Dictionaries). Another definition states that art is "works produced by human creative skill and imagination."

The emphasis upon the existence of humanity and the soul in art greatens in some of the most influential quotes. Elder Uchtdorf quoted "the desire to create is one of the deepest yearnings of the human soul," and Adrien Elmer "art is when a human tells another human what it is to be human." The connection between humanity and art has been unseparated since the birth of art itself. Through the passing of millennium, science has disproven the belief that lightning was the wrath of gods, while astrology and mathematics have challenged the idea that the earth was the center of the universe. However, until now, the belief that art was related to the human soul and humanity itself has never been toppled. Perhaps the criticism and controversy upon using artificial intelligence to create art are intimately bound with the faith in humanity's supposedly divine, singular ability to exert creativity.

Amongst reviewing the ethical accusations against AI, however, one must recall that artificial intelligence itself is a replica of the human intellect. The structure of the deep learning model and the way they learn suggest that creating intelligence isn't about making machines smarter, but about making machines like human beings: to think, learn, and even imagine like us. If artificial intelligence advances to the point in which it can parallel the diverse functions of the human brain, then there is nothing that holds it back from becoming something very "human" indeed. Another fact that must be reviewed is that the criterion of labeling art isn't absolute; rather, it shifted with eras and the tides of popular culture. The expressionist and post-modernist movement alike had proven that art is sufficient when it can generate emotions in people. If art by artificial intelligence can do the same, who's to say that AI lacks in creativity?

It must also be noted that utility of artificial intelligence in art isn't about taking human artists out of a job: it is more about galvanizing and vitalizing the world of art. Francesca Rossi, a research scientist at IBM J.T. Watson Research Center, says "I think you have to be clear about what the goal is...The goal is to help humans be more creative, and not just to replace painters or songwriters or whatever. I think that's usually the way it's perceived, so that's why you have this resistance. So maybe the systems should be put in a package that shows clearly that you want to help people be more creative." (Ward, "2017). A new wave in art has always met great resistance, but one must remember that embracing it has also always opened a new chapter in its history. The question isn't about what AI may or may not do for art, but what it could, and will do.

#### IMAGE CLASSIFICATION

Image Classification uses a particular type of deep neural network, called a convolutional neural network (CNN). CNNs are particularly useful for distinguishing images and categorizing them. (Krizhevsky, et.al. 2012)

Our main goal is not to design algorithms that learn how to generate art and music. Such a goal would be premature as the area is in its infancy. But to make progress, we can use AI to distinguish between genuine original artwork and counterfeit works. Already there are AI programs that can distinguish between genuine currency and counterfeit currency. (Goodfellow et.al. 2014)

I. Convolutional Neural Network (CNN)

Pixeled images are processed by a multi-layer network that identifies visual features. As shown in the Figure 1, the network consists of four main steps (i.e. convolution, pooling, full connection, and output prediction). (Goodfellow et.al, 2016)





Figure 1.

Because neural networks process images as a two-dimensional array, each pixel in the image is given a numerical values from 0 to 255. A wholly black pixel is given the value of 0 and a wholly white pixel is given the value of 255. Red, green, blue layers or RGB layers are needed for colored images so a numerical value is given for the intensity of color's saturation in the pixel. The computer will then recognize the images in digital form by giving it a value of 0s and 1s. (Goodfellow et.al, 2016)

## II. Steps of CNN

1. Simply put, convolution can be understood as the sorting of digital information. Its purpose is to simplify input images by sorting out particular features. A feature detector — also called as kernel, or filter — is placed on an input image. The values on the pixel and on the feature map are multiplied and the resulted values are placed on a feature map or an activation map. Although the feature map may lose some information, the processing speed is increased because the reduced size of the image requires less calculations. The purpose of the feature detectors is to eliminate features that are not important to the processing task, emphasizing the features that are only important. Multiple feature maps may be used to further filter the image while preserving the spatial relationship between pixels. This process is represented in Figure 2 below. (Goodfellow et.al, 2016)



Figure 2.

#### 2. ReLU layer

ReLU layer, rectifier layer units, is a process by which a rectifier is subsequently applied after convolutional layers are built. The mathematical foundation for this layer is f(x)=max(0, x), as seen in Figure 3 below. In other words, the activation is simply threshold at zero; his increases nonlinearity in images. In other words, the ReLU layer accelerates the convergence of stochastic gradient descent compared to the sigmoid/tanh functions which in turn accelerates the overall computational time for the CNN. (Krizhevsky et al., 2012)







### 3. Max Pooling

Like convolution, max pooling's purpose is to reduce the spatial size of the image and to decrease the computational complexity of the calculations. The most common procedure for this is called max pooling, as seen in Figure 4.



This is done by taking the maximum value in each grid from the feature map as seen in Figure 4 above. In this example the maximum value in the green grid is 21, the brown, 12, the red 18, and the blue 10. By only considering the maximum values and disregarding other values, the number of parameters are reduced, thus preventing overfitting.

4. Flattening

After max pooling, feature maps go through the flattening process by which the numbers are taken row by row and placed in a single long column. Once all pooled features are flattened, the results form an input layer to be connected to a deep neural network.

5. Full Connection

Once the Convolutional Neural Network is connected to the Deep Neural Network, the attributes of both networks may be combined to take advantage of the what each network provides as a benefit. (Krizhevsky et al., 2012)

#### **DEEP NEURAL NETWORK**

While deep learning and artificial intelligence has elevated recently in the global technology market as a significantly prestigious mechanism, the concept of deep learning has in fact been around for several decades. Although the idea of creating an algorithm-based network was first introduced in the 1980s, deep learning technology had to undergo years of refining and breakthroughs to resemble that of today finally. (Goodfellow, 2016.)

At first, deep learning was primarily achieved by training a perceptron, or an algorithm for supervised learning. Training samples inserted into the perceptron results in a calculated output, and after each entry and exit procedure, the algorithm is adjusted to prevent errors. However, the approach of utilizing a single perceptron for deep learning soon met a drawback of it only being able to learn linear, simple information, which meant that the algorithm was powerless against outliers that eluded the category of the perceptron. (Goodfellow, 2016.)

To resolve this issue, researchers created a multilayer perceptron, also called a feedforward neural network. A neural network was nothing more than a composition of multiple units; each consisted of a single perceptron, connected to each other to create networked layers of algorithms. The layers were composed of three parts, according to their functions: the input, output, and one or more hidden layers, as seen in Figure 4. Such organization of neurons allowed the neural network to process high-dimensional vectors, for each layer serve to establish a comprehensive goal of learning, sorting, and utilizing data. Especially, the one or more hidden layers help to store the abstract representation of input data, similarly as does the human brain. (Goodfellow, 2016.)

### Deep neural network



Figure 4.

The utility of hidden layers often proved to be effective, but met a few drawbacks such as vanishing gradients or overfitting, in which the back-propagation process – process in which the error contribution in each perceptron is detected and dealt with – lost significance due to too many hidden layers or was to concurrent with the training data. Only after decades of setback was these difficulties resolved, majorly by autoencoders and the Boltzmann Machine, that allowed the learning of probability distribution and thus precise, non-overlapping calculations. Therefore, the deep learning model was finally able to process and handle data in a flexible, comprehensive manner. It was after this procedure that it was viewed as a complete technological duplicate of the human brain. (Goodfellow, 2016.)

## APPLICATIONS

Work is underway currently in Stanford where programmers are training convolutional neural networks to recognize who the artist that created an image is just by inputting an image into a network. (Viswanathan, 2017) As CNNs advance in power and efficiency and as the computation power of computers increase, the potential for AI and all its permutations becoming more and more prevalent in the art community will exponentially develop.

## IMPLICATION FOR EDUCATION AND TEACHERS

That AI cannot substitute for a human teacher or tutor effectively may be an accurate statement currently. However, that fact should not mean a total rejection of the role artificial intelligence in art education because this paper has illustrated the potential uses of CNNs in processing and classifying images.

Educators must assume the concept that new technologies in AI when fully exploited will change the way art is taught and learned. This has larger ramifications because the traditional methods of learning, working, collaborating, and communicating are increasingly being modified. Educators must begin to devise new pedagogies, implement innovative digital systems, develop new areas of knowledge, and inform policymakers and educational stakeholders. (Luckin, et. al 2016)



## CONCLUSION

To some scholars and artists, the question of "can" and "may" in artificial creativity is much more of a problem than "can" and "may" as in going to the restroom. To them, it is either a heretic idea or a mere joke: a bad one, too. Technically speaking, the structure of deep learning is no more than layers of data tissues and nodes. However, deeming the model unfit of creativity, for this reason, would be denying the very creativity of humans, for technically speaking, the human brain is but layers of data tissues as well. If the goal of creating AI is indeed to create "artificial intelligence," there is nothing that can, or should, stop computers from thinking, perceiving, and creating, as human beings do.

The idea of a constantly evolving breed with intelligence and even creativity is admittedly a disturbing one. Most scholars and technicians have realized that an era in which artificial intelligence will inhibit majority of human life has already come and that the fear of them taking over "human" jobs is a reasonable one at the least. However, researchers also claim that the ultimate objective of deep learning is to better human life, not replace it, even if it could. Similarly, the function of AI in the field of art revolves around the interest in duplicating, not eradicating, human creativity. This artificial intelligence should be viewed and studied as more of a tool: a gift. Embracing this new achievement and learning to utilize it affectively may lead to a more fruitful future in the field of art and creativity.

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# Cinema at School for an Interdisciplinary Approach

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## ABSTRACT

This paper presents a research concerning the introduction of Cinema at High School. This is an experimental work on the use of Cinema as a resource for teachers and students.

The Cinema, at school of different levels, usually is suggested as "cineforum" experience, a use of cinema based on the description of themes and a debate on the analytical interpretation of films. However describing the contents of a medium is not enough to develop a critical approach: today's the schools of each levels are called to bring a different perspective on cinema and digital media education. Teachers and students, by the digital technologies, can explore the movie experience. Learning Economics-Business and Law understanding the value of historical cinematographic culture is the aim of this research project. The Cinema, through the early films, promotes the interdisciplinary teaching and the introduction of visual language. This project promotes and enhances the cinematographic heritage of the world by encouraging the teachers to introduce the Cinema at school.

**Key words:** high school, cinema and digital media education, economics-business studies and law, social science curriculum, interdisciplinary approach, collaborative learning, active learning.

#### INTRODUCTION

The Italian school contexts have not even well appreciated the use of cinema for teaching and learning experiences as a multimedia educational resource such as in the school contexts of other countries. Although in Italy, we have the attention of the Government, thanks to the new national indications on teacher's curricula (Trinchero et al., 2013) and the national law in force "Buona Scuola". In relation to teacher's curricula of high school, the Italian Government published a Ministerial Order, n. 211 on 7 October 2010, called «Indicazioni nazionali riguardanti gli obiettivi specifici di apprendimento concernenti le attività e gli insegnamenti compresi nei piani degli studi previsti per i percorsi liceali». The law in force on the Italian School Riform called «Buona Scuola», law n. 107 of 13 July 2015 the Art. 1 is specific on the invitation from the Government to introduce, at school of each levels, the media education with a critical approach together the study of film and picture language. Moreover, the European Parliament underlined the importance of safeguarding the cinematographic heritage with the European Parliament Report on the Commission Communication on cinema on 7 June 2002.

The Department of Human Sciences "Riccardo Massa" at the University Milano-Bicocca Italy and the High School *Liceo Statale Carlo Tenca* in Milano, Italy has carried out in 2015 this pilot project on the pedagogical value of Cinema at School promoting the interdisciplinary approach and developing, refining active and significant experiences of Learning. Specifically, we proposed the use of cinema as a resource for the subjects of Economics-Business Law Studies integrated with the history of Cinema, its origin, given the expressivity of its symbolic language and the importance of the International Cinematographic Cultural Heritage. Several teachers of High School in Lombardy, with their students, explored and encouraged the cinema experience thanks to the use conscious of digital technologies.



#### THE STUDY

In contrast with cineforum method, the current research project on cinema and digital media education aims to understand how to design a course on Economics-Business and Law using an interdisciplinary approach.

The project founded on the idea to offer activities on analysis of film language, movie making and editing to the students of high schools — and later a stage to trainee teachers — on how to make innovative use of Cinema to overcome the rigid disciplinary boundaries' forms of teaching.

The research project followed the methods of the interdisciplinary approach by Repko (2008) and the theory of Bergala (2008) relating film fragments to one another by organizing them around a theme (F.M.R.). Teaching and learning Economics-Business and Law starting from selected movies, especially the early silent movies, from the origin of Cinema history.

Other aim of this research is to exploit digital technologies in schools as a resource for boosting cooperative and collaborative learning, mainly in relation to "knowledge society" and the use of ICT (Calvani 2007, 2009; Yildiz and Keengwe 2016).

The research project began in 2015. The first year was been a pilot phase dedicated to monitoring the experimental activities. At the beginning, we proposed this experimental work to one class, now the participants are 60 students with age from 14 to 16 years, the total is four classes.

## FINDINGS

The theory of Alain Bergala (2008) founded on a pedagogic approach to cinema organizing, among other suggestions, a movie library at school, the use of movie fragments and clips strategic selected for the lessons and for elementary film editing exercises.

The recent literature on the interdisciplinary teaching has shown that students attracted by and engage more readily with interdisciplinary approaches, which help them to acquire new knowledge and reinforce existing knowledge. (Repko 2008).



**Figure 1**: Expanding the borders of Cinema and Visual Arts, the students explored other frontiers of knowledge among Human culture, Arts, Science, Economics-Business and Law.

We are interested on the "reactivation" and consolidation within the cognitive development processes of individual students.

Once we have identified the connections and affinities among the various disciplines, our creative energy was in one direction to answer the follow question: how can we relate them to one another in such a way as to enhance students' comprehension? (Poli and Benussi 2016). Moreover, other question: how can we foster creative connections allowing students to acquire novel perspectives and new cognitive strategies as they integrate new knowledge and acquire new abilities? (Bolter and Grusin, 2002; Calvani 2007, 2009; Dee Fink 2013; Gordon 2000; Maldonado 1997, 2005)

The proposed methodology helped students to become familiar on problem solving, thinking and decision-



making, critical analysis, reflecting on information exchanged, etc. We tried to describe, with a quantitative graphic representation (see Figure 2) the student's perception regard the efficacy for each different model of lesson proposed (Benussi 2016).

	1	2	3	4	5	6	
Classical teaching	1	7	8	2	5	4	~
Teaching projecting the textbook onto the	3	6	5	7	2	4	$\sim \sim$
interactive white board (IWB)							
Multimedia teaching (*)	3	3	5	7	7	2	
Flipped classroom teaching (*)	5	3	8	3	6	1	$\sim \sim$
Exercises in labs (*)		2	6	6	8	5	
Active teaching style: debates in class inspired		4	2	4	10	7	$\wedge$
by the British parlamentary style debating							$\sim$
Activities in collaboration with universities	3	2	6	4	4	8	$\langle$
Law practical exercises in labs (*)		4	3	5	13	2	
Economics practical exercises in labs (*)		3	2	6	14	2	$\langle$
Classes held in labs based on interaction with	2	2	7	2	7	6	$\land \land$
multimedia (*)							

**Figure 2:** The student's perception of efficacy for each different models of lesson. (\*) Interdisciplinary Approach Cinema – Law – Economics Business.

The interdisciplinary approach became even more fruitful, thanks to our proposal to teach the language of film and watching earliest films from the origin of Cinema, film realized by the pioneers of cinematographic international heritage.

The lessons explored themes on Economics Business and Law by the classical teaching mode and other lessons introduced film literacy, increasing the audiences, knowledge and interest in film language, in particular among the audiences of new generation.

The students threw up surprising connections with other disciplines. The intersecting of different disciplines helped students to attain a deeper understanding of certain concepts and in particular, the root causes and complexity of themes that featured strongly in the early history of film (e.g. the first examples of Cinema advertising Europe to USA and the first USA movie copyrighted).

We introduced also other teaching modalities as the flipped classroom (classrooms in labs watching/listening to multimedia debates), the lean back (characterized by unidirectional reading or watching certain content prevails), and the lean forward (characterized by active and cooperative Learning). In addition, we proposed practical exercises in computer laboratory based on the analysis of multimedia contents in Economics Business, Law, watched early silent movies, significant film sequences and exercises on film language analysis and movie editing (see Figure 3 e 4).



Figure 3: Students working at school in the computer laboratory



Figure 4: The Freedom of Worship, frames from one example of short film made by a student (2016-2017)

# CONCLUSIONS

The students' evaluation on the results of these teaching/learning experiences was been positive.

The majority of students recognizes the efficacy of the interdisciplinary approach and the incisiveness of different teaching models of lessons in perspective of their future personal professional experiences.



The students appreciated the innovative teaching methodology based on interdisciplinary approach. However, they also valued positive the traditional teaching methodology.

They developed, among other skills, some fundamental economic principles, they are more conscious on the complexity of contemporary human society, about how to live in this world, and ask oneself if proper values coincide with the rules of law.

Moreover, from the positive results emerged the need to foster well-established cultural connections and relationships in different fields recognizing the challenges of the contemporary knowledge society, in order to prepare students to become Global Citizens and aligned with the actual Educational and Social Studies.

Our research project continues the promotion of the significant role of Cinema and the film language for an interdisciplinary approach on teaching and learning at different school levels and several other disciplines.

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# Collaborative Work and Technological Means for Improving Learners' English Language Writing Production

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## ABSTRACT

Writing is probably the most complex skill to develop during the foreign language acquisition process because of its specific features. This work aims to improve learners' English language writing production through working collaboratively and using technological means. One hundred ten students (38 males and 72 females) from two Ecuadorian universities participated in this study, which applied Collaborative Learning (CL) and Project Based Learning (PBL) approaches during 2015-2017. A group of participants answered online surveys and participated in focus group discussions to identify the strategies they use during their writing practice. It was found that participants' efforts and time dedicated to improving their writing skill in quality and quantity have a direct relationship with the learner's interests. It is concluded that the combinations of collaborative work and the use of technological means improve the development of participants' written communicative competence. The main progress was centered in the acquisition of technical vocabulary, improvement of participants' writing style and coherence of the text. Similarly, PBL fostered the improvement of participants' writing production in quantity and quality.

Keywords: Collaborative work, Project Based Learning, online applications, writing competence, role-play scripts, research essays

## INTRODUCTION

When foreign learners begin higher studies, they need to be trained constantly on reading, writing and interpreting academic complex texts. Such challenge requires hard work, especially when the goal is to develop writing skills in the foreign language. Furthermore, it is necessary to consider that students' communication styles are changing in the two universities where the present study was conducted from a passive way of learning, in which students only receive knowledge from the instructors; toward an active learning, in which students look for knowledge from their peers with the aid of technological resources.

Despite this fact, it has been observed from previous studies that students have not developed enough their English writing skills since they present issues on lack of vocabulary, inappropriate grammatical structures, incoherence in the ideas, etc. It is essential to overcome these problems because intelligible writing allows keeping documents even more current (Sánchez y Contreras, 2012).

Nowadays, students have access to a wide range of information for amusement and educational purposes through the use of technological means; thus, it is necessary to encourage students to read articles or books in the target language to gain knowledge about different topics and become familiarized with the correct English writing. Studies related to technological means were conducted by Hsu (2014) and Sharma (2015) who discussed the use of audiovisuals as authentic material to develop written communication properly and meaningfully. Additionally, teachers should direct students to use online dictionaries because they are tools that facilitate learners to develop writing skills during the beginning learning stage. Once they acquire more vocabulary and higher grammar knowledge, they will feel more confident to use dictionaries less frequently. However, novel writers find in "Web sites and resources that involve interaction (chat-rooms, wikis, blogs) on the Internet [...] as complementary tools for language learning" (Cevallos, Intriago, Villafuerte, Molina, Ortega, 2017, p.111). Scholars as Aydin & Yildiz (2014) and Nguyen (2013) argued that collaborative learning allows students to create texts as members of the educational community. Mutwarasibo (2013) made important contributions about the significance of collaborative work to prepare students for the job market. In this respect, it is observed that 75% of young professionals in England do not communicate properly; consequently, educational institutions need to take measures to improve communicative competencies (British Chamber of Commerce, 2014). This is seen in Europe, where young people not only speak incorrectly but also use the inappropriate tone of voice. Such linguistic phenomenon affects clients' perceptions, and as a result, they decide not to purchase the products or services. This inappropriateness can also be seen in the written communication since young professionals might not transmit the information correctly causing the reader to be confused or disappointed, and because there is no clarity in the terms of the deals, business settlements are not arranged.

For that reason, the objective of the present study is improving learners` English language writing production through working collaboratively and using technological means. To accomplish this goal, it necessary to answer the following research questions:

How do students collaborate in class to write scripts and research essays in the target language?

What technological means are used to write English language scripts and research essays?

How can students improve their writing production using technological means?

## LITERATURE REVIEW

## 1. Development of writing skills in the university context

The development of oral and written language skills during the process of a foreign language (FL) acquisition is a challenge necessary to accomplish. Therefore, the use of technological information and Communication (TIC) facilitates writing activities performance to develop the macro abilities (Herrera, Morales, Holmes and Herrera, 2011).

Williams (2012) maintains that writing tasks take more time than speaking. When writing, students have the opportunity to deal with communication problems by asking more experienced peers, consulting dictionaries, or simply going into detail about their knowledge during the writing process. For this purpose, instructors need to lead learners to work collaboratively to get the most from each other when developing a written task.

Strategies as Role-Plays have demonstrated important contribution for the development of communicational skills, but also its combination with the use of technology in the local and foreign sphere has demonstrated outstanding results. Therefore, the results obtained through integrating Facebook and Skype to execute role-plays and dialogues on line, allowed to improve participants' Speaking and Writing skills with the collaboration of their peers and the self-correction (Yen, Hou & Chang, 2015).

Education in the XXI century must focus on the population's needs. The United Nations set the Agenda 30 goals for the sustainable development to propose a route to follow (UN, 2015). Consequently, the use of role-plays is proposed for script writing practice in a real-life context. "Role-play is a communicative activity related to Project Based Learning (PBL), with a didactic interactive approach that fosters the interaction based in real-life situations, with authentic language and material" (Rossi, 2016, p. 57). In this sense, communication according to Rossi (2016) is based on content more than on form.

However, in current practice to develop learners' English writing skills, "the culture of developing higher levels of thinking and reflection through this form of composition is almost inexistent. Using it as an opportunity for EFL learners to learn how to write and try out the new language" (Cevallos, Intriago, Villafuerte, Molina, Ortega, 2017, p.111).

## 2. Collaborative work for developing writing skills in a foreign language

In relation to CL, a study centered on the use of wikis for collaborative English writing projects in Foreign Language classrooms applied collaborative argumentative, informative, and decision-making writing by working in groups of four students. Similarly, the writings of the students in the wikis were analyzed to investigate about self-corrections and collaborative corrections as well as changes in relation to form and meaning (Aydin & Yildiz, 2014).

Another study about CL was focused in collaborative English writing situations as a second language. This study investigated the ways in which the Vietnamese students of English as a foreign language made possible peer structure among them during a collaborative presentation and how they benefit from this experience. The results show that collaborative work among peers creates the necessary learning conditions to have students help each other (Nguyen, 2013).

As a consequence, collaborative work is recognized as a valuable tool for learning development centered on the students. Its importance is seen in two ways: Firstly, when students are regularly encouraged to do collaborative work, they are inclined to develop skills of interpersonal communication. It is also thought that collaborative work properly organized and well lead can make students develop more cognitive skills. Secondly, it is often discussed that through working collaboratively, students gain experience and comprehension to how responsibilities are done in the workplace. Therefore, collaborative work leads students to be prepared for the job market (Mutwarasibo, 2013).

The motivation for writing among students is not easy. Within the writing problems, there are the generation and organization of ideas, thought patterns, cohesion, and coherence. However, to overcome these problems, it is necessary to have a variety of activities to transmit ideas through script writing and drama performance (Nurhayati, 2016).

### 3. Digital competence for novel writers

The European Parliament (2006, p.10) defined the term -digital competencies- as "the skills to search, obtain, process and communicate information, and transform it into knowledge [...] the challenge to develop reasoning skills to organize, relate, analyze, summarize and elaborate information again".

The introduction of Web 1.0 in the educational system generated more autonomous learners able to develop learning process in their own rhythms. As a result, learning environments became more authentic and coherent to current times. The Web 2.0 gave learners the possibility to focus on the content of their interests (grammar, phonics, writing, vocabulary, etc.) and the barriers of the physical distances were overcome. The web 3.0 allowed collaborative work among learners who are connected and exchange material in different formats as texts, videos, sounds, pictures, etc. Such exchange of information leads learners to produce their own materials. Consequently, it is remarked that learners are the ones who assume their own learning processes (Michavila & Parejo, 2008).

The introduction of digital clouds in the educational system allowed showing evidence of students' learning progress. Digital clouds can be accessed from any computer, tablets or smartphones with an internet connection and support the exchange of heavy documents in different formats (Nevin, 2009). They are used globally to link the communication tools and educational services (Sanchez & Contreras, 2012) offering a wide range of potential uses during the professional education.

The appropriate use of information and communication technologies (ICT) enables learners to build new experiences of writing. They also allow setting collective and collaborative learning, potentially reshaping space and school time, and expanding the role of the teacher as a knowledge mediator (D'Imperio & Rosendo, 2013). In different contexts, writing is still the most used communicative skill; such condition demands future professionals to develop the competence for efficient writing communication. However, "teaching of the written language is mainly linked to the automation of the processes of codes' domain, and the learning of pre-established norms" (Martin del Campo and Martinez, 2014, p. 14).

At the beginning of the writing experience, learners use writing tools as on line translators and electronic dictionaries. In this case, Ecuadorian learners consider that online applications are essential for language learning; similarly, students report that not all tools are trustworthy due to the quality disparity of different languages dictionaries (Jin and Deifell, 2013).

To Musk (2014), target language avoidance appears through the use of online dictionaries. Likewise, Jin & Deifell (2013) observed that the generation of these dictionaries has had noticeable consequences in the way novel writers use the foreign language. In Ecuador, "learning is still seen as teacher dependent and as such, the idea of going to a website to learn a language is difficult to grasp as effective. It is well known that a central principle in language acquisition is being exposed to the language" (Cevallos, et al, 2017, p.111).

Among the most common ICTs used in the process of writing development, audiovisuals, blogs and mobile applications, electronic dictionaries, and Google applications appear to be the most popular. The following lines offer a description of them.

#### a. Audiovisuals

A study conducted by Hsu (2014) relates to the importance of multiple English expositions before writing tasks. Additionally, it aims to explore the possibility to increase active vocabulary with a focus that goes beyond the first most frequent 2,000 words. The researcher incorporated online videos in his writing classes at the university and examined its effects in the use of advanced vocabulary.

To activate the previously learned vocabulary, a variety of audiovisual models was applied before the writing tasks: (1) videos with subtitles, (2) videos without subtitles, (3) silent videos with subtitles, and (4) videos only with sound. When English students watch a video with subtitles in the target language, they need to pay attention to two types of visual inputs (images and texts) as well as an audio input (sound) and as a consequence, they have a greater access to the target language. The audio effect explains why some students are able to write better with a variety of vocabulary after using audiovisuals. The online videos serve as an additional component that facilitates students to acquire knowledge for a writing topic. Before writing, the researcher looked for videos in YouTube and Google about movie extracts and in these way students found writing topics (Hsu, 2014). Another study related to the use of audiovisual programs, live chats, TV debates, live movies and other authentic materials that replace books. In this way, the author of this study maintains that there is also a focus on sociocultural aspects that would avoid any wrong selection of spoken English words putting into play the communication purpose. Therefore, if students listen to native speakers, the script and essay writings will be more appropriate.

## b. Blogs and mobile applications

Vurdien (2013) studied the use of blogs and explore how this tool involves a group of English students to practice writing skills through collaborative work. This instrument allows learners to freely write opinions since they all create a personal blog and read others' opinions, share ideas, and make comments on their peers' publications. The objective of the project was to activate the writing skills through specific tasks of writing, perceive the feedback effects of peers, and improve collaborative skills. Working among peers led students to improve planning and choose the correct style required for each task before the writing and work submission. Similarly, collaborative work was fostered through the students' interaction in the blogs.

Another study based on PBL was conducted by Nisbet & Austin (2013) who maintain that the applications available in smartphones and tablets are effective tools to increase the vocabulary development of adult students.

Additionally, through the collaboration between students and teachers, there are different options for the autonomous learning through projects (Nisbet & Austin, 2013). According to Savery (2015), PBL approach centers on the students and aims to encourage them to do research, integrate theory with practice, and apply knowledge and skills that would lead them to solve a specific problem.

## c. Electronic dictionaries

According to Jin and Deifell (2013), the online dictionaries generation has influenced greatly the way in which students learn a foreign language. A study conducted by those authors examines the use and perceptions of foreign students regarding bilingual online dictionaries through analyzing 250 answers to a web form survey of students enrolled in a language course in the United States. The results show that online dictionaries are consulted the most when students are creating and deciphering digital written texts.

## d. Google applications

The action research conducted by Intriago, Villafuerte, Morales, Lema, and Echeverria (2016) aimed to improve English language reading comprehension and speaking skills virtually in college students through the use of Google Apps and Literature Circles (LCs). The results demonstrated an effective development of the reading comprehension and speaking skills in the target language. The participants went from A1 to B2 of the Common European Framework of Reference for Languages (CEFRL). Therefore, it is concluded that the use of "Google Apps" built virtual learning communities to strengthen the second language development at the university level. For this purpose, if students are motivated to read through Google Apps, they will develop better writing skills since they familiarize with the correct structure of sentences and acquire new vocabulary.

## METHODOLOGY AND INSTRUMENTS

Table 1

The present study is an action research work which applies mixed methods of research to determine (i) Strategies applied by participants during their writing production in English language, (ii) Participants' attitudes for language practice using TICs, and (iii) Participants' perceptions about key activities for the writing production in English language.

The sample is composed of 110 students (38 males and 72 females) from two Ecuadorian public universities located in two different cities in Ecuador. The selection criteria of participants included the following three conditions: To be officially enrolled as students in each of the participant's universities during the period 2015-2017, to attend classes regularly, and to have the willingness to participate in this project.

Locations	Male	Female	Total
Machala	18	42	60
Manta	20	30	50
Total	38	72	110

Source: Project Registration (2015-2017)

## Instruments:

Participants

(1) Electronic Survey to identify learners' strategies applied during their writing practices. This instrument was designed ad hoc, by the research team. It consists of 7 questions about the electronic tools learners use during their writing practices. The instrument was tested by professors from Universidad Tecnica de Machala, Ecuador; using the experts-review triangulation method. This survey was applied through a Google Apps form.

(2) The Likert questionnaire of Villafuerte & Romero (2017) titled Learners attitudes towards the idiomatic practice on ICT. It was applied using an electronic form of Google Apps. The testing of this instrument reported a Cronbach Alpha = 0.83 in all their items, which is accepted by following the international standards for this

kind of research.

(3) Focus group discussions that consist of 10 questions to determine key activities participants do during their writing practice. This instrument was designed ad hoc, by the research team, and tested using the technique - experts review triangulation-. Researchers from Universidad Tecnica de Machala in Ecuador collaborated in the validation test of this instrument.

## **Research organization**

- This work was organized according to the following steps
- Step 1: Quantitative instruments application: Likert questionnaires.
- Step 2: Qualitative instruments: Focus group discussion

Step 3: Analysis of the participants' writing production:

## **RESULTS AND IMPLICATIONS**

## Step 1: Quantitative instruments application: Likert questionnaire

# (i) Electronic Survey to identify participants' strategies applied during their writing projects

The results of the survey are shown in Table 2.

## Table 2

Strategies participants use for writing

Items		Always		Sometim es		Rarely		Never	
	n	%	n	%	n	%	n	%	
1. I Write the research papers and scripts first in Spanish and then I translate them completely to English using Google Translate.	9	29	13	41,9	1	3,2	8	25,8	
2. I write the research papers and scripts directly in English.	7	22,6	17	54,8	4	12,9	3	9,7	
3. When I write the papers and scripts, I use Google Translate only in certain words or phrases I do not know.	10	32,3	20	64,5	1	3,2	0	0	
4. I use online dictionaries to consult words to use in the research papers and role-play scripts.	8	25,8	10	32,3	9	29	4	12,9	
5. I ask for help to the teacher when I don't know how to say or write something in English necessary to write the role-play scripts and research papers.	3	9,7	14	45,2	11	35,5	3	9,7	
6. I ask my classmates for help to write the writing tasks.	11	35,5	10	32,3	6	19,4	4	12,9	
7. I use the words, phrases or expressions learned in class to write the writing tasks.	20	64,5	11	35,5	0	0	0	0	

Source: Project survey (Oct. /2016).

It is observed that 41.9% of the participants -sometimes choose to use the Google translator- to translate to English their full texts (scripts or essays) that were written in Spanish. When learners choose their first language avoiding the use of the target language, the foreign language acquisition decreases significantly (Musk, 2014). However, 54% of participants chose to write their scripts and essays directly in English.

Another significant finding was that 64.5% of the participants -sometimes use Google Translator- to translate phrases and expressions, they do not know in English; and 25.8% of the participants chose the -use of online dictionaries- during their writing production. However, 29% of the participants do not have the need to go to online dictionaries.

It was also observed that 35.5 % of the participants rarely ask the teacher for help; only 9.7% of them do it, but 35,5% of the participants always look for their peers' assistance. In this respect, the contribution of Savery (2015) leads us to understand that participants in - PBL- which focus primarily on collaborative work combine theory with practice to encourage learners to solve problems.

Finally, 64.5% of the participants mentioned that they always use vocabulary and grammar learned in the classroom; but 35, 5% of them indicated that they sometimes do it. In this regard, Williams (2012) argues that writing practices deepen learners' knowledge in a short time.

(ii) Learners attitudes towards the idiomatic practice on communication and information technologies The most relevant Learners' attitudes regarding English writing practice using TICs are presented in table 3.

Participants' attitudes toward language practices using technological means

Dimension 1: Integration of SNS into academic activities	N	Mín.	Max	Sum	Averag e
1.1) I think using social networks is easy.	110	1	6	569	5.17
1.2) I think I know perfectly well how to use the social networks such as Google+, Facebook, YouTube, WhatsApp.	110	1	6	543	4.94
1.3) I think I do not need tutorials or help to use social networks Google+, Facebook, YouTube, WhatsApp, and Twitter.	110	2	6	490	4.45
1.5) Social networks sites like Facebook, YouTube, Google+, etc. facilitate contact with other people for collaborative work.	110	1	6	611	5.55
1.8) I think that university students do use the functions offered by social networks in multiple educational activities.	110	1	6	557	5.06
Dimension 2: English Language Practice through Social Network S.	N	Mín.	Max	Sum	Averag e
2.1) Social networks sites because their functionality should be used for English language practice in higher education.	110	1	6	488	4.44
2.3) Social network sites are useful when working in a group	110	1	6	437	3.97
2.6) The Social network site I would use to practice the English language is google+.	110	1	6	386	3.51

Table 3

2.15) I like the computer to correct my spelling in the English language.	110	1	6	589	5.35
2.20) If I want people understand my messages in English, I must check very well my spelling before uploading them to the web.	110	1	6	543	4.94
N. Valid answers.	110				

Note: Results of the research project (Mar. /2017).

Source: Results from the Likert questionnaires regarding learners' attitudes toward language practices using technological means (Villafuerte & Romero, 2017).

Participants showed positive attitudes toward the language practice using TICs and Social Networks. These attitudes are observed in the following items:

1.1) I think it's easy to use social media: 5.17 points average; 1.2) I think I know perfectly well how to use social networks such as Facebook, YouTube, Google+: 4.94 points average.; 1.8) I think that university students do use the functions offered by social networks in multiple educational activities: 5.06 points average.

Participants answered the following items showing their conviction about TICs and SNS as a support for collaborative work in English Class: 1.5) Social networks like Facebook, YouTube, Google+ make easier to contact with other people: 5.55 points average; 2.1) Social networks sites because their functionality should be used for English language practice in higher education: 4.44 points average; 2.6) the social network site I would use to practice English language is Google+: 3.51 points average; 2.15) I like the fact that the computer corrects my spelling in English: 5.35 points average; 2.20) If I want people to understand my messages in English, I must check very well my spelling before uploading them to the web: 4.94 points average.

## Step 2: Qualitative instrument - Focus Group Discussion

The information collected by the focus group discussions were categorized into the following stages: Planning, execution, and evaluation. The results are shown in table 4.

Table 4

Key activities executed during the collaborative scripts writing practice

Categories	Activities	Category
Planning	Task Distribution and delegation	Moderate
	Analyze the topic	Very High
	Brainstorm	Moderate
	Collaborative work	Moderate
	Write the dialogue clearly	High
<b>F</b> errorite a	Use of audiovisual resources	Very Low
Execution	Use understandable vocabulary	Very Low
	Relate the paper to the tourist area	Very Low
	Relate to activities done in classroom	Moderate

Evaluation		Very Low
	Find help in people with more knowledge in English	
Note: Results of	the research project (Mar. /2017)	
Graphic 1.		
Cloud of the most	frequent words repeated by the participants.	
	Find help in people with more knowledge of English	
	Collaborative work	
	Task distribution and delegation	
	Write the dialogue clearly	
	Relate the paper to the tourist area	
	Analyze the topic	
	Use understandable vocabulary	
	Brainstorm	
	Relate to activities done in o	class
	Use of audiovisual resources Source: Results of the focus group discussions (Dec. /20)	16)

The cloud graph presents the phrases that have been repeated around the category key activities executed during the collaborative writing of scripts. It is observed that "Analyze the topic" is the phrase of participants' greatest interest. These responses are linked to the category planning.

While the least repeated sentences "Use of audio visuals", "Use understandable vocabulary" and "Relate to the area of future work" correspond to the category -execution-. In relation to the category evaluation, the phrases observed are "Find people who have more knowledge of English" and "Relate to activities done in class". In this regard, role-playing is a communicative activity based on PBL with a didactic and interactive approach that fosters the interaction founded on real-life situations with authentic language and material (Rossi, 2016, p. 57). In addition, Hsu (2014) maintains that it is important to be exposed to English before writing since its objective is to increase vocabulary in an active way.

## Step 3: Analysis of the participants' English language writing production

The analysis of the participants writing production development is presented in the following table: Table 5 Evaluation of Participants writing production

Evaluation	valuation of 1 articipants writing production								
Writing	Main	challenge	and	Collaborative	Quality and Quantity evolution				
Product	progre	SS		support					

Scripts	Writing role-play scripts enable students to practice vocabulary, phrases and expressions learned in class in a real-life situation.	Students asked peers for support and used technological means such as Google translate to consult words they did not know.	<ul> <li>Initial production:</li> <li>Students did not participate in any communicative writing activity such as role-play scripts.</li> <li>Quality: Students did not know a lot of English vocabulary, phrases, and expressions. Therefore, their writing production was poor.</li> <li>Final state: During the study, learners participated in 20 role-play scripts by using the English words, expressions, and phrases learned in class.</li> <li>Quality: Students' written abilities improved significantly because they were able to increase the number of new words. Similarly, their grammar usage developed effectively.</li> </ul>
Essays	Writing essays require novel writers to review scholar's publications for quotation. Writing essays develop digital competence in novel writers when they use ICT tools. Writing essays is controlled in the following aspects: grammar, pragmatics, content, Corrections and final quality control.	In this case, participants asked teachers for assistance more than to their partners to check grammar and writing styles. Consequently, the main messages in the text are understood since it becomes coherent, catch and maintain the reader's interest.	Quantity: Initial production: Each student participated during one semester with a half essay. Final production: Each student participated with an essay of a good level per semester. Total production 5070 essays. Quality: Initial state: average accepted. Final state: good.

Students' sustained acquisition of technical vocabulary and usage of previously learned class content.

Students developed their digital competence in the search of online information using TI

Learners wrote 20 scripts using collaborative scripts of high quality.

Learners wrote 50 research essays on time.

Learners showed improvement in their writing styles and coherence.

Learners use appropriate vocabulary and punctuation.

Source: Authors creation. (Aug. /2017).

Regarding the use of technological means to write role-play scripts and essays in the English language, the result of the surveys and the focus group discussions applied in this study show that Google Translate is the participant's most used tool during the execution of the writing projects.

Furthermore, results also corroborate with the insight that learners' positive attitudes for English writing are highly necessary. Learners' most relevant progress consisted in the use of clear phrases, appropriate vocabulary, direct language, and attention to details. It is also valuable to use short and simple sentences, organize the ideas and citations following a chronological order, and to develop a personal style of written communication. Other findings obtained during this research are:

### Use of ICT for English papers revision

In this study, it is observed that Google Translate is the electronic tool most preferred by participants to write English language scripts and essays. Similarly, a study conducted by Jin & Deifell (2013) ponders that the generation of online dictionaries has affected the way students learn a foreign language. Accordingly, the use of technology focuses also on socio cultural aspects that would avoid any wrong selection of spoken English words putting in risk the communication purpose (Sharma, 2015).

#### **Collaborative work**

On the other hand, only one participant mentioned preferring working individually since it facilitates the generation of better ideas. According to this participant, there is not an agreement or an order when working in groups. However, previous studies have shown that collaborative work has proved to be an effective technique to develop writing skills. In this sense, Aydin & Yildiz (2014) conducted a study on the use of WIKIS for collaborative writing. Additionally, collaborative work leads students to develop more cognitive abilities and experience about how to handle responsibilities at work (Mutwarasibo, 2013). In this regard, according to Jin & Deifell (2013), online dictionaries are used the most when students are creating and understanding a digital written text.

#### Peer review during writing scripts practice

In relation to asking for help to write role-play scripts, the surveys showed that students rarely ask the teacher for assistance during the writing activity. On the other hand, the results of the focus group discussion showed that the majority of students ask their peers for help. As a consequence, most of the learners feel the necessity to work collaboratively with their classmates to write the scripts instead of asking the teacher for help. For this reason, collaborative work is the most preferred learning mean of the students.

Similarly, concerning the option of asking peers for help to write the role-play scripts, the surveys showed that they always did it. For that purpose, the focus group discussions showed that "analyze the topic" to write the dialogues was the most repeated phrase by the participants when they work collaboratively. In relation to using the learned content in class to write the role-play scripts, the surveys demonstrated that the majority of learners did it and the rest of them only occasionally. Likewise, the surveys showed that the minority of students do not use what it was learned in class.

## Peer review during writing essays practice

Participants were open to the reviews and recommendations of teachers, but they were not totally open to accepting peers' review. Participants maintained that their peers did not have the experience and the necessary knowledge to criticize their papers. However, participants agreed about having their peers give opinions about the writing style of their papers for a better reading comprehension.

## CONCLUSION

The results of this study confirm that participants' efforts and time dedicated to improving their writing skill in quality and quantity have a direct relationship with participants' interests or motivations. Even though ICTs enable learners to get higher levels of performances in their writing projects, the motivation for learning a foreign language is the most relevant factor that leads professors and students to collaborate with each other during writing practice.

Additionally, the use of technological means such as Google Translate and online dictionaries are fundamental tools to support learners in their writing of role-play scripts and research essays collaboratively. For this reason, students rarely ask the teacher for help to perform their writing projects since the majority of times they ask their classmates.

The use of technological means encourages learners' creative writing production of role-play scripts and

research essays as part of a PBL process. After this practice, students are able to accomplish their collaborative writing tasks because they relate their ideas to real-life situations and previous research work. Furthermore, PBL enables learners to help each other to generate well-written dialogues and phrases since they have the opportunity to give their opinions respectfully about their peers' work. Consequently, the quality of their writing improved when they were well motivated to spend more time working and making an effort to produce written documents of the best quality.

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# Comparison and Evaluation with Similar Type Program to Brush-Up System for Re-Educating Social Workers

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## ABSTRACT

In recent years, the problem of shortage of successor in manufacturing industry in Japan has been concerned. In this paper, it has clarified the existence of other reasons for causing crisis of manufacturing by the following analysis. It is still a lack of understanding from the company and the support from the government, as well as lacking of studying about re-educating issue by the universities in Japan. There is a positive correlation between public expenditure on studying and making improvement of productivity. The enhancement of learning opportunities is necessary to overcome international competitiveness. Based on the analysis and evaluation above from our research, we are starting to promote the unique brush-up program for social workers.

## **1.INTRODUCTION**

At Hokkaido University of Science (April 2014 school name change from Hokkaido Institute of Technology), the Core Human Resource Development Course for Citizen Core "Production Management Expert Cram School" is being held( Mikami, 2007& 2012). There are two objectives of this human resource development project aimed at this university. The first is to develop human resources who are responsible for technological innovation for machinery metal fabrication assembling manufacturing industry, which is regarded as vulnerable in Hokkaido. The other is to nurture manufacturing experts for factory supervisors and production control personnel who are responsible for the core of the enterprise. In recent years, the authors focused on the following two points of crisis concerning Japan's monozukuri due to the shortage of successors. First, what are the requirements for prevention of exit from business and corporate management required for core engineers from now. Second, what kind of production method / management method is effective for steadily progressing technology and skill succession. As a result, the author is in the uncertainty of survival measures corresponding to changes in the times seen in the Fourth Industrial Revolution, such as led by IoT and AI, behind the absence of advanced corporate human resources development as expected I am concerned. It is often said that although it is a serious problem of industry-specific problems with chronic talent shortage and aging society structural problems, it is not. Meanwhile, under the initiative of the Ministry of Education, Culture, Sports, Science and



Technology, in July 2008, "Brush up Program for professional (BP) certification system was established to promote learning of social workers. Therefore, at this university, since in January 2008, we have only begun to examine the "Production Management Expert Cram School", which is an existing similar lecture course, with the direction to connect it progressively with this BP system. In this paper, in order to make this connection fruitful, we analyzed similar courses that we have worked on so far. Furthermore, in order to effectively function BP to be introduced in the future, we evaluate the current performance and propose future courtermeasures.

## 2. CURRENT STATUS ANALYSIS

## 2.1 Outline of previous courses

This time, the practical lecture subject to discussion of connection to BP was opened as a core human resource training course for engineers from 9 years ago. The course was conducted regularly at the rate of 8 times / half a year. The theme that responded to the deepening of the times and the times has been selected. The recruitment capacity is 30 people and is targeted at engineers who work for companies located in Sapporo city and suburbs, age, sex, work in charge of work are also various, and attendees who are motivated to improve businesses gathered (Mikami. 2010). Table 1 shows the plans and achievements of the core human resources development business in 2016. Looking at the contents of this program eight times, it consists of "lecture", "practical skill", "corporate tour", "presentation", and the lecturers are selected not to bias the field. The program of lecture No. 4 in the table I was in charge of is participating in all the past 9 years while changing contents. We will briefly describe the role played by the control mechatronics intelligence information (CMI) of Mechanical Engineering Department, which is the educational research field of the authors.

Table 2 shows the transition of Course No. 4. Our philosophy is technical support to accelerate the development of open innovation to challenge new possibilities. To do that, core human resources must introduce the fruits of the distinctive frontier area which are distinguished both in development and processing, and must provide and share development and manufacturing technology specialized. Five times in the first half have been deepened into a course focused on robust sequence control and the rest on the introduction of IoT's technology centered on 3D printers. Currently the business fields of SMEs are expanding, the diversity of needs and the speed of change are extremely rapid. New product introduction cycles are as short as half a year to one year, and early launch of facilities is required. Therefore, one of the technologies playing an important role is sequence control that easily follows "Variant and Variable Production System" (Sasagawa, 2011). By introducing this technology to the site, it is considered possible to realize improvement both in productivity and quality, in addition to one-stop engineering which can be integrated with the customer from the product development stage. On the other hand, as an example of IoT conversion in the second half, it is working with a smartphone. Also, if necessary, we exchange product information with headquarters and office, promptly transfer modeling data to 3D printers for trial production, proceed with modeling using travel time by the vehicle, after arrival at the destination It is also possible to immediately provide prototypes or parts. In this way, we are introducing a case where a one-stop working environment utilizing IoT technology is already being realized.



NO	Theme	Overview
1	Opening Ceremony – General Topics How to view and think about KAIZEN	Recognize the current situation and future directions of manufacturing in Hokkaido and confirm the viewpoint of thinking and viewpoint of production control and cost reduction. Learn the knowledge of the Ergoma approach from the viewpoint of "fusion of productivity and humanity"
2	How to make improvements by just in time production method	Learn how to think and think about improvement in just-in-time production method in an easy-to
3	How to proceed with 5S activities	Learn 5S (arrangement, organization, cleaning, cleanliness, discipline) which is the basic Kihon in the basic to advance work and improvement well by item.
4	Fundamentals for making jigs	Learn about the theory of sequence control which is the foundation of saving labor and making jig tool and easy use technique using "GX Developer" exercise equipment.
5	Basic IE (Industrial Engineering) method	Learn the "IE method" that quantitatively and qualitatively grasps the waste lurking in work and movement indispensable for discovering problems at the site.
6	Tab Just-in-time exercise	ILT quiter instantiate Charte Aplixery in various types of small-lot production, we need to consider "Just-in-time thinking" as necessary (as necessary, (produce, delivery)) as necessary (quality and price) Learn knowledge and skills through exercises.
7	Advanced corporate tour	Implement improvements related to QCD including introducing just-in-time production, and observe advanced companies that have achieved a great deal of results.
8	Improvement reports by students Closing ceremony	Ask the students to report improvements made by each company, using "Before and After" photos. Based on these results, summarize the seminar.

Table 1 The plans and achievements of the core human resources development business

Year	A theme with a re-educating element added	Aim of the course
2010	Understand the outline of PLC	Know the usefulness of PLC
2011	Programming with SFC	Know the merit of condition matching type coding
2012	Programming with application instructions	Knowing data storage and calculation method by register
2013	Innovative jig processing and sensor connection	Modeling with a 3D printer
2014	Various variable quantity production System I	Modeling with a 3D printer
2015	Various variable quantity production system II	Evolving Additve Manufacturing(AM)
2016	IoT and Various Variable Production System	M and Industry - 4.0

Figures 1 (a) - (c) are the results of analyzing the composition of the participated students

## 2.2 Expectation for this course seen in composition of participants



Figures 1 (a) - (c) are the results of analyzing the composition of the participated students. (A) percentage of age, (b) percentage of years of service, and (c) percentage of posts. The total number of people attending the Core Human Resource Development Program has reached 291 in the past nine years, which is the number of (A) As for the proportion of the age of the students, from the aim of naming the core technicians and aiming to be a managerial strategy, the 10 years after university graduation, 12 years from the college of technical college, 14 years after the high school graduation seems to have passed Accounts for 70% of the total. (B) The percentage of years of service of participants is 22% from 6 years to 10 years, nearly 50% together with 27% from 11 years to 20 years. Based on this fact, we are actively participating in courses due to background such as being active as an outstanding company in current companies, being forced to acquire the skills required at the present workplace due to career change, etc. Can be inferred. (C) Most of the participants took on some role in the position of the position of posts, and there were also directors who served as corporate heavy responsibility, assistant manager and deputy director. Meanwhile, there are also a large proportion of manager chief and group chief class in charge of personnel training, and it can be seen that there is an aim to compensate for aging of managers and lack of successor in the background. Also, the proportion of the department to which the student belongs from another survey is attended.

Figures. 2 shows a questionnaire result of the student for the course No. 4. (1) From the results of Q2, it can be seen that there are mixed expectations and anxiety for problem discovery and resolution ability, such as introduction of "Various Variable Production System" and IoT, in half of the 5 point difference. (2) From the result of Q3, even if you can understand what you took, you can see that it is a different problem from using it immediately for work. It is an important result concerning the basis of the main point of the course. (3) From the result of Q4, it can be seen as a result showing the necessity for structural change of the manufacturing industry. That is, Japan enters the era of "multiple equations" and "simultaneous equations" where there are four or more variables such that "ICT" and "environment" are added to "maturity", "population decrease", "declining birthrate and aging" (Seki, 2016). There is an indication that it did. Moreover, they are faced with a transformation period that they have to solve. In addition, as an impression of free description, I got a good reputation that "I felt the sequencer capable of operating various machines with a simple program attractive", "I was able to dispel the difficult impression of 3D modeling" There. Meanwhile, we received stern opinions such as "How can we make use of it at our own factory?", "Strong image hard to improve what specific concrete improvement can be made".



- Q1: Were the contents of the lecture as you expected?
- Q2: Can you take lectures and make use of it to your work?



Figures. 2 questionnaire results of the student for the course No. 4

#### 3. ISSUES FOR Realizing BP

### 3.1 Current Status Regarding Learning of Students

Looking back at the discussion so far, it is possible to regard the core human resource development worker for society as an opportunity offering of a kind of social worker's learning. If it is, it seems that it is not so high hurdle to convert this training business to BP as it is. However, despite the organizational program supported by the Ministry of Economy, Trade and Industry etc., there is a truly disappointing reality. It is clear that the entrance to social workers to higher education institutions in Japan is at the lowest level in developed countries and the reluctance to re-learn many of private enterprises is clear from materials submitted by the Ministry of Education, Culture, Sports, Science and Technology to the Central Education Council University Subcommittee (Natsume, 2016).

Figure 3 shows the percentage of international students enrolled in higher education institutions who are over 25 years of age (international comparison) by the Ministry of Education, Culture, Sports, Science and Technology, according to the Ministry of Education, Culture, Sports, Science and Technology, The percentage is 1.9% in the undergraduate degree program of 25 years old and over, and 14% in the master's course of over 30 years old. This is well below the OECD (Economic Cooperation and Development Organization) member country average 17.6% of the undergraduate degree course and 30% of the master's course, and it is at the lowest level in developed countries. In the citizen's consciousness survey, 19.1% responded that they learned again, 30.3% thought that they wanted to learn, and nearly half received it positively. In contrast, as shown in Figure 4, education of private companies Training expenses have flatly declined since the 1990s, and have shifted to flat. Education and training that emphasizes importance is also mainstreamed in the daily work, 74% of full-time employees and 77.2% of nonpermanent employees, and it is not positive to receive regular education and training to leave. Also, I will point out that the design of institutional design at the faculty of engineering is extensive, unlike MOT, MBA and law school, so it is a big problem to which kind of curriculum is to be constructed.



Figure 3 The international students enrolled in higher education institutions

#### 3.2 Overview and evaluation of BP

In Japan, the need for learning of social workers is called out, MEXT has taken related measures such as selection of special entrants, night classes, day and night courses, subjects such as courses, student certification system. We also focused on programs based on competitive funds, "Strategic Promotion Project for Core Professional Human Resources Development in Growth Areas" (2011), "Program for Re-educating Public Human Resources for Advanced Human Resources" (14 years), "Vocational ability practical skills development program" (15 years), etc. Recently, the educational revitalization execution meeting has made proposals on policies on learning of social workers, and the Ministry of Education, Culture, Sports, Science and Technology, Ministry of Education, Culture, Sports, Science material of the Educational Revitalization Conference held in March, 2015, which is summarized very well (Ministry of Education, Culture, Sports, Science and



Technology,2015. Sustaining Learning Society, 2015). For BP certification, it is required as a requirement for implementation that efforts that social workers are easy to attend such as opening weekends. In particular, what is being evaluated is the fourth part of the certification requirement enclosed by the dashed line. In other words, it is a requirement that more than 50% (guideline) of the program is occupied by lessons of two or more practical educational methods out of the following (1) to (4). This is described. (1) Workshops by teachers and practitioners (Over 5 years of practical experience in the field of study) (2) Interactive or multidirectional discussion (Problem discovery  $\cdot$  Solution type workshops, workshops etc) (3) Activities in hands-on experience (internship, study abroad or field survey etc) (4) Classes in collaboration with enterprises (field work with companies etc.).

## 3.3 Company's Understanding of Revisiting

Despite aggressive promotion measures by the government, why are there few people who are learning from regular courses at universities? That is to say that schooling depends too much on individual voluntary efforts, in other words, the lack of support from companies and public institutions. According to the "University Survey on University Education Survey of Workers" (2009), there are only a few social workers who answered "graduate school studies" as a work related learning method, mostly "reading books", "various workshops · Participate in seminars "etc. are mentioned. The reasons why graduate school can not be studied are as follows: (1) The cost is too high (2) The working hours are long and there is not enough time. (3) The workplace is unable to understand (The workplace does not allow schooling) (4) In many cases it was not evaluated in terms of. Sixty percent of the respondents answered that "costs spent on learning are less than 10,000 yen", and no economic margin is felt either. According to Waseda University's "Research on Grasping the Education of Graduate School Education for Adults" (10 years), 8.0% of the companies surveyed sent employees to the graduate school during the past 3 years, and small businesses 3.9 %, Big company 17.5%. Most companies do not allow studying in graduate schools, and even if they admit it, there are many companies whose conditions are permitted by their bosses. Looking at the tuition burden situation (multiple answers), the self-burden is overwhelming, 87.8%, the corporate burden 12.1%, the university burden (benefits type scholarship etc.) 5.4%, the government burden (education and training benefits etc.) 1.6 %. A series of investigations is mainly targeted at graduate schools, but it seems that there is no big difference in the undergraduate stage. From the survey, the real person concerning the learning of the social worker as follows is obscured and hidden. It can not be expected of corporate support, but rather is sometimes constrained. Even if you care about working around while securing your learning time somehow, you will have to pay a large tuition fee burden. I felt the necessity of schooling at the university / graduate school, but I can not fulfill it while I wish. Therefore, there are only measures to encourage learning with means of inevitable and inexpensive expenses. It is a matter of fact that it is difficult for society people to learn again unless they are prepared for a big sacrifice and risk.

### 3.4 What should be learned again

Originally, the development and improvement of capabilities of employees should be beneficial for both individual employees and companies. The fact that companies have carried out internal education is because the understanding of that point has been shared, and it is the same that the government promotes learning of social workers. If the roles and responsibilities of companies concerning vocational ability development fall backwards, it will increase for individuals. The reason individuals try to tackle the development of capacity and quality of workforce on their own responsibility is that companies evaluate whether the developed capabilities are worthy of adoption, employment maintenance, and treatment. Therefore, the individual side will only make efforts to seek improvement of employment and treatment, but what if we do not. Meanwhile, the reason why support for learning of companies is insufficient is that many companies are unable to endure long-term employment maintenance and education and training investment under a severe business environment.

Nonetheless, investment in education and training should be essential if business performance improvement and economic growth are ultimately stipulated for the quality of human resources. As shown in Fig. 4, about 70% of the companies that have problems in human resource development have a problem. The reason is that the shortage (about 50%) of talented persons and the lack of time (about 47%) are cited, and it can be seen that the company loses the margin of human resource development. What is expected is public support, but according to the Ministry of Health, Labor and Welfare, public spending on education and training programs in Japan accounts for 0.03% of GDP, about a fifth of the OECD average is there.



Figure 4 The companies that have problems in human resource development

How about overseas? Among the severe fiscal circumstances, many countries have established support systems for continuing learning by society. For example, in France, employees who satisfy prescribed conditions can receive education they desire using paid holidays regardless of regular or irregular. Tuition fees are free in principle and can be tackled with skill development without adjustment to working hours, concern for surroundings, worry of expenses, etc. There is also a separate development of skills that companies conduct as business orders. Both of the main financial resources are education and training contributions imposed on companies. There is no chance of international competition if you are mercilious about investing in human resource development. Employment after retirement in population reduction and pension problems will continue to increase. The demand for capacity improvement is only growing, and both countries and companies should make drastic investments in re-learning of working people.

## 4. Recommendations for analysis and evaluation

### 4.1 Recommendation Part 1 Enrichment toward knowledge-based society

Here, we would like to point out interesting facts on the relationship between low labor productivity and higher education. Figure 5 shows the labor productivity of OECD member countries on the horizontal axis with per capita public expenditure to higher education institutions. It is drawn as the vertical axis. As can be seen from the approximate curve, there is a beautiful positive correlation between labor productivity and public expenditure per capita to higher education institutions. The correlation coefficient is as high as 0.832 (Murata, 2017). It is said that in the theoretical model incorporating human capital formation in higher education, it is possible to theoretically explain the relationship between them. It is said that it is a knowledge-based society, and thinking that support to higher education institutions is affecting labor productivity is not quite unnatural at.



Figure 5 The higher education institutions for affecting labor productivity

#### 4.2 Recommendation 2 Medium- and long-term perspectives

Effectiveness of education including university does not appear in a short period of time. It is necessary for at least 20 years for current primary school students to leave the university and become active as the center of organization. Even 18 years old university freshmen, it will take more than 10 years to be responsible. Although the university's "quality assurance of education" is shouting loudly, it takes 10 to 20 years time to show the effect of education.



Therefore, in designing institutions for human resource development, political party politics is not pursuing short-term policy goals and effects due to victory in the election campaign, but policy advice based on a mid- to long-term perspective is important, Is it the most sought-after item? Educational policies that make it possible should become a key to

### 4.3 Recommendation 3 Search for new financial resources

On the other hand, for university education, it is also a tough fact that the per capita public expenditure on national universities and private universities has a big gap. If the relationship shown in Figure 5 is correct, increasing public spending on private universities, which accounts for more than 70% of students, is considered to lead to the creation of a foundation for Japan's economy. To that end, it is a fact that we need financial resources. Even though the Ministry of Education, Culture, Sports, Science and Technology recognizes the importance of higher education, it is currently the case that sufficient budget for higher education has not been secured. Considering the long-term effect of 10 to 20 years, it will be necessary to secure a financial source different from the previous ideas. I would like you to seriously review the administrative division between ministries and agencies

### **5. DISCUSSION**

Based on the above, I would like to organize the points to keep in mind to establish the university BP currently under consideration. The application period is for 2018, and the past few months are a critical moment. 1. Currently Hokkaido's economic power point is food, tourism, auto parts, etc., but our university has tackled education for social workers to "human resource development of manufacturing industry". With a strategy based on this, it will be a program that can push security and trust forward.2. Nursing programs, etc. are also conceivable to support women's advancing to society, but they do not have consensus of undergraduate medical departments about BP as a premise within the university and may overlap with the graduate school establishment period of undergraduate course, We will decide not to implement implementation in fiscal year 30 in system field. 3. Since the possibility of implementing BP for each faculty is high in our university which has practical academic general university, it is possible that we will organize rotation in each department in the future. Particularly, applying the practical educational method will be consistent with the Diploma Policy of the University, and we believe that it will advance toward realization of certification. It is required to provide a program that can not be inferior to the company's unique technician education system with awareness of the division with some advanced dominant universities.

## 6.CONCLUSIONS

As mentioned above, it became clear that introducing the BP certification system makes it difficult to seek outcomes without resolving problems that hinder the promotion of promotion of educational reforms held by companies and social workers. It is important to remember that the time span until educational effect appears is long even if new program of support for social worker is added or review of institutional design is applied. To that end, it is important to establish a steady PDCA cycle for each program, proceed with scrutiny of the contents, and make efforts that do not become democratizing like "making the Buddha without entering the soul" is important.

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# Competencies of Teachers of Children with Autism Spectrum Disorder in Inclusive Elementary Schools in the National Capital Region: Basis for a Proposed Training Program for Professional Teachers

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## ABSTRACT

The study aimed to present the teachers' profile, namely: (a) type of school, (b) teaching position, (c) highest educational attainment, (d) years of experience in teaching children with autism spectrum disorder (ASD), and (e) number of trainings attended in educating children with ASD, determine their levels of competencies on: (a) knowledge of the disorder, (b) structure in the classroom, (c) teaching language and communication, (d) teaching social competence, (e) decreasing problem behaviors, and (f) special issues, test if there was a significant difference on the levels of competencies of teachers when they are grouped according to their profile, and specify the problems encountered by the head teachers and teachers in terms of their competencies when children with ASD are included in the regular kindergarten classrooms. Descriptive research and purposive sampling were used. Thirty-four kindergarten teachers and 12 head teachers answered the modified Skill Competencies for Professionals and Direct Support Staff in Virginia Supporting Adolescents and Adults with Autism. Frequency, percentage, weighted mean, and independent sample t-test were employed. Few schools practice inclusion. Few teachers have teaching experience and trainings on ASD. Private school teachers are more competent than public school teachers. Teachers with longer years of experience and greater number of trainings are more competent. There are satisfactory levels of competencies. Problems in decreasing problem behaviors were ranked first, followed by teaching language and communication, teaching social competence, knowledge of the disorder, structure in the classroom, and special issues.

Keywords: competencies of teachers, children with autism spectrum disorder, inclusion

## INTRODUCTION

Of the 92.1 million household population in the Philippines, about 16 per thousand had disability. Among the 17 regions, Region IV-A had the highest number of persons with disabilities (PWD) at 193 thousand followed by the National Capital Region with 167 thousand PWD. The Cordillera Administrative Region, on the other hand, had the lowest number of PWD at 26 thousand (Philippine Statistics Authority, 2013).

In 2007, there were 2,149 special schools with 59,029 (0.49%) children with special needs enrolled in the elementary level (National Institute of Special Needs Education, 2007). Today, there are only 416 special education (SPED) centers nationwide that are funded by the government, with four more waiting for recognition. There are almost 200 public schools that offer a SPED program but without a center. That is 620 out of 34,000 public elementary schools in the Philippines (Geronimo, 2014).

Recognized as a condition (Silberman, 2015), regarded as the most rapidly growing developmental disability, and ranked as the 6<sup>th</sup> most commonly classified disability in the United States of America (National Center on Birth Defects and Developmental Disabilities, 2011), autism spectrum disorder (ASD) occurs in all social, racial, and ethnic groups and is estimated to currently affect 1 in 68 children (Center for Disease Control [CDC], 2014). In March 2012, the prevalence rate was 1 in 88 children. This marked a 23% increase since the last report in 2009 (CDC, 2012). In December 2009, the prevalence rate was 1 in 110, reflecting a substantial increase from the rate of 1 in 150 reported just a few years earlier (CDC, 2007).

The National Institute of Mental Health (NIMH, 2014) defines ASD as a group of developmental brain disorders where the term "spectrum" refers to the wide range of symptoms, skills, and levels of impairment, or disability

that children with ASD can have. Thus, some children are mildly impaired by their symptoms, but others are severely disabled.

As of May 2013, psychologists and psychiatrists have been using the diagnostic criteria for ASD as they appear in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) when evaluating individuals for these developmental disorders:

- A. Persistent deficits in social communication and social interaction across multiple contexts;
- B. Restricted, repetitive patterns of behavior, interests, or activities;
- C. Symptoms must be present in the early developmental period;
- D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning;
- E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay (American Psychiatric Association, 2013).

McIntyre, Blacher, & Baker (2006) stated that kindergarten is the first major educational transition in a student's educational career and a particularly important transition for students with ASD because a successful kindergarten transition leads to better academic outcomes and better generalization of skills. Mainstreaming provides opportunities to students with disabilities to spend a portion of their school day in the general education program and a portion in a separate SPED program. Inclusion is the "education in the mainstream of regular education regardless of race, linguistic ability, economic status, gender, age, ability, ethnicity, religious, and sexual orientation" (The Salamanca Statement and Framework for Action on Special Needs Education, 1994). The theory behind inclusion is that both students with and without disabilities benefit when they are taught in the same classroom with high expectation and positive interactions (Eldar, Talmor, & Wolf-Zukerman, 2010).

A pressing educational challenge facing school officials globally is ensuring educators are not only prepared to include these students but are trained as well to teach them effectively and according to grade level standards (Loiacono & Valenti, 2010). A significant concern of teachers responsible for students' learning in the inclusive classroom is their lack of knowledge and understanding of, as well as professional preparation for accommodating the characteristics and needs of individuals on the autism spectrum (Bellini, Henry, & Pratt, 2011). Most teacher-graduates receive minimal to no preparation in evidence-based practices for students diagnosed with ASD, being prepared through a single introductory course as general education majors or other courses centered on strategies and accommodations to address a variety of disabilities as special education majors (Morrier, Hess, & Heflin, 2011).

The main purpose of Teffs & Whitbread (2009) in conducting their study was to determine the level of formal and informal preparation of teachers to teach children with ASD as well as teachers' feelings of confidence and competence to include this population of children in their classroom community. A random selection from a database of teachers and administrators in Connecticut public schools was used. The survey was designed to gather information about the confidence and competence of general education teachers to include students with ASD in their classrooms. A number of participants reported having no formal training in the following areas, namely: (a) characteristics of ASD (35.4%), (b) instructional strategies (33%), (c) implementing the individualized education program (35.7%), (d) behavioral supports (42.9%), (e) social skills training (48.5%), (f) communication (46.9%), and (g) assistive technology (61.9%). Some participants commented that most of their training had come from their direct experiences working with children with ASD and from what they read in books and journals. More than two-thirds (76.9%, n=83) reported the necessity for more training or support to better meet the needs of their students with ASD. Within this group, the most frequently cited area in which additional training was needed includes social skills (82.9%), followed by behavioral supports (78%), communication (70.7%), assistive technology (63.4%), characteristics of ASD (52.4%), and implementing the individualized education program (48.8%). Responses to the survey showed that general education teachers in Connecticut had little training specific to teaching students with ASD and once in the classroom may lack the support they need to provide an appropriate education for students with this disorder.

Messemer (2010) investigated perceptions of general education teachers regarding the inclusion of children with ASD. More specifically, the qualitative study used interviews to examine the relationship between self-efficacy and the willingness of ten teachers (six of whom taught primary school; four teachers taught middle and high school) to teach children with ASD in inclusive classrooms. Twelve open-ended questions were used during the interview process. Participants were unanimous (10/10) in reporting that disruptive behavior had a negative impact on their ability to teach and the students to learn. Analysis also revealed that nine out of ten participants

believed they could teach all students in their inclusive classrooms, however, inclusion required additional administrative support, planning time, and professional development. Barnes (2008) has reaffirmed this result. Previous research indicated that even when general education teachers received academic instruction and / or professional development training related to the inclusive classroom, they still did not feel completely prepared to instruct children with special needs in inclusive education settings (DeSimone & Parmar, 2006). Research findings for the past 50 years have reported that general educators perceived that they did not have adequate training to teach children with special needs in an inclusive environment (Kilanowski-Press, Foote, & Rinaldo, 2010).

Byrne (2012) examined regular education teachers' attitudes towards inclusion relative to their training on ASD. Teachers also identified barriers and benefits to inclusion. Participants included 100 out of a solicited 291 (34%) regular education teachers from K-12. A modified version of The Teachers' Attitudes Toward Inclusion Scale (TATIS), created by Ji- Ryun Kim (2011) was used for the study. The TATIS measured attitudes and beliefs that were critical to the inclusion of students with disabilities. It was modified to focus specifically on attitudes on inclusion of students with ASD. There was an overall significant difference in regular education teachers' attitudes towards the inclusion of students with ASD based on their training. Regular education teachers reported the following were barriers for including students with ASD into their classrooms: uncontrollable behavioral outburst that led to classroom disruptions (47%), required additional planning time (11%), and lack of support staff in their classroom (10%). The results revealed that teachers had more positive attitude towards the inclusion of students with disabilities when they had more SPED training. Regular education teachers who have no training with students with ASD may gain a more positive attitude towards inclusion if ASD training is provided to them. The most commonly reported barriers in including a student with ASD are behavior problems. Providing teacher training on behavior management for students with ASD may increase their openness in including students with ASD. A major barrier for the inclusion of students with ASD into the regular education classroom is lack of teacher training and understanding of ASD (Finke, Mcnaughton, & Drager, 2009; Scheuermann, Webber, Boutot, & Goodwin, 2003).

The purpose of the study by Hayes, Baylot, Williamson, Black, & Winsor (2013) was to examine any correlation between general education teachers' self-rating of academic training and professional development regarding students with ASD and their actual knowledge in each of the following areas: (a) evidence-based methods of teaching children with ASD, (b) teaching in an inclusive environment, and (c) characteristics of students with ASD. The participants were 38 males and 166 females from both public and private schools. Findings revealed that participating teachers did possess the knowledge necessary to teach students with ASD but lacked an understanding of how to do so in an inclusive environment. This lack of understanding may be due to the focus or breadth of the professional development or the specific academic training provided. Possibly any training these teachers received focused only on the content noted (such as characteristics and teaching methods related to ASD) and not on the application of that knowledge. This finding suggested that increased training emphasis should be placed on applying knowledge of ASD in an inclusive educational setting.

The study of Edward (2015) generally found that poor knowledge, lack of appropriate training, and lack of inservice training among teachers were highly associated with teachers' perceived challenges in teaching children with ASD in regular classes. The study also confirmed and extended those findings that existing teacher education training programs often did not adequately prepare teachers to resolve challenges associated with teaching children with ASD in regular classes. Teachers need to have a comprehensive knowledge of autism disability and be able to manage the manifested overt behaviors (Hart & Malian, 2013). This implied that handling children with ASD in regular classes required teachers who have knowledge and skills of inclusive settings.

Braid (2015) stated that one concern in the educational system of most developing countries today is the need to address the state of teacher-training institutions in terms of quality of existing teacher-training programs. Among the observed gaps are the lack of preparation of teachers in diagnosing students' capacities and are, thus, unable to address the demand for needed competencies; many teachers are not properly trained to deal with special students, especially those with emotional and behavioral challenges.

As per United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2006), research contributing to improvement in teacher development and training is required so that teachers working in difficult conditions can adapt to the changing paradigms of learning in the context of globalization. It is by acquiring new and relevant skills and improved teacher training that could have a multiplier effect on the way teaching-learning

processes are organized and learning outcomes are influenced.

According to the World Health Organization (2013), most people with ASD and other developmental disorders live in low- and middle-income countries; however, most of the knowledge about these conditions is based on research done in high-income countries. The need to develop human capacity, especially in low- and middle-income countries, has been raised as a priority issue in the development of services for ASD.

## STATEMENT OF THE PROBLEM

The study sought to describe the competencies of teachers of kindergarten children with ASD in the public and private elementary schools in the National Capital Region. Specifically, it aimed to answer the following questions:

1. What is the respondents' profile in terms of:

- 1.1 Type of school;
- 1.2 Teaching position;
- 1.3 Highest educational attainment;

1.4 Years of experience in teaching children with ASD; and,

1.5 Number of trainings attended in educating children with ASD?

2. What are the levels of competencies of teachers in terms of:

2.1 Knowledge of the disorder;

2.2 Structure in the classroom;

2.3 Teaching language and communication;

- 2.4 Teaching social competence;
- 2.5 Decreasing problem behaviors; and,
- 2.6 Special issues?

3. Is there a significant difference on the following levels of competencies of teachers when they are grouped according to their profile?

- 3.1 Knowledge of the disorder;
- 3.2 Structure in the classroom;
- 3.3 Teaching language and communication;
- 3.4 Teaching social competence;
- 3.5 Decreasing problem behaviors; and,
- 3.6 Special issues?

4. What are the problems encountered by the head teachers and teachers in terms of their competencies when children with ASD are included in the regular kindergarten classrooms?

### METHODS

The descriptive research was used in this study conducted in the Department of Education (DEPed) recognized public and private elementary schools with special education (SPED) centers in the National Capital Region. Only kindergarten teachers who are currently handling children with ASD and who have taught these children within the last five (5) years were included in the study.

A modified Skill Competencies for Professionals and Direct Support Staff in Virginia Supporting Adolescents and Adults with Autism was utilized. A pilot test was conducted to validate the contents of the questionnaire. Twenty (20) teachers from private schools that mainstream or include children with ASD in their kindergarten programs outside Metro Manila participated in the dry run.

Frequency distributions, percentage, and weighted means were used for descriptive purposes. To test for a significant difference on the levels of competencies of teachers when they are grouped according to their profile, the independent sample t-test was employed.

## RESULTS

There were 34 teachers, 13 from the public schools and 21 from the private schools handling children with ASD in their regular classrooms. There were 12 head teachers from the six public schools and six private schools for a total of 46 respondents.

Only one (2.9%) public school teacher has a Master's degree while there were two (5.9%) private school teachers with Master's degree. The rest (91.2%, n=31) of the teachers earned a Bachelor's degree. Only two (5.9%) public school teachers had a background in SPED, whereas, nine (26.5%) private school teachers had SPED background.

Most (84.6%, n=11) of the public school teachers and majority (61.9%, n=13) of the private school teachers had 1–5 years of experience in teaching children with ASD.

Many (69.2%, n=9) of the public school teachers had not attended trainings in educating children with ASD, whereas most (61.9%, n=13) of private school teachers had attended 1–5 trainings.

	Туре	Teaching	Highest	Years of	Number of
	of	Position	Educational	Experience	Trainings
	School		Attainment	in Teaching	Attended in
				Children	Educating
				with ASD	Children
					with ASD
Knowledge of the	3.13	3.13	3.13	3.13	3.11
Disorder					
Structure in the	3.29	3.29	3.29	3.29	3.29
Classroom					
Teaching	3.17	3.17	3.17	3.17	3.17
Language and					
Communication					
Teaching Social	3.28	3.28	3.28	3.28	3.28
Competence					
Decreasing	3.11	3.11	3.11	3.11	3.11
Problem					
Behaviors					
Special Issues	2.93	2.93	2.93	2.93	2.93
Overall	S	S	S	S	S

 TABLE 1

 Overall Levels of Competencies of Teachers

Table 1 shows that there is a satisfactory level of competencies of teachers of children with ASD in inclusive elementary schools in the National Capital Region. Structure in the classroom received the highest mean score (3.29) followed by teaching social competence (3.28), teaching language and communication (3.17), knowledge of the disorder (3.11), decreasing problem behaviors (3.11), and special issues (2.93). Based on the results, teachers' weakest area of competency is addressing special issues or the understanding of the sensory systems, sensory processing, and sensory motor development. According to Virginia Autism Council (2013), stereotypical behaviors such as rocking or hand flapping, or triggering fight, flight, or freeze responses exhibited by individuals with ASD are related to sensory processing and commonly interfere with learning. This is an important finding of the study. Teachers need to understand the implications of special issues when children with ASD are included in the general education classrooms. They must be trained on how to address these special issues. Knowledge of the disorder and decreasing problem behaviors were at the bottom. It is important for teachers to have a complete grasp of the characteristics of children with ASD as well as the functions of the problem behaviors in order for them to develop a deeper understanding of these children and show a positive attitude towards their inclusion in the general education classrooms.

Indicator		WM	t	P -	Decision	Remarks
				value		
Knowledge of	Private	3.40	2.862	0.007	Reject	Significant
the Disorder	Public	2.70			Но	
Structure in the	Private	3.57	2.817	0.008	Reject	Significant
Classroom	Public	2.83			Но	
Teaching	Private	3.46	2.961	0.006	Reject	Significant
Language and					Но	
Communication	Public	2.70				
Teaching Social	Private	3.61	3.239	0.003	Reject	Significant
Competence	<b>D</b> 1 11				Но	
	Public	2.75				
Decreasing	Private	3.42	2.939	0.006	Reject	Significant
Problem					Но	
Behaviors	Public	2.62				
Special Issues	Private	3.20	2.672	0.011	Reject	Significant
	Public	2.50			Но	

 TABLE 2

 Significant Difference When Respondents Are Grouped According to Type of School

Table 2 reveals a significant difference among the six (6) competencies of teachers when grouped according to type of school. The p-values are less than the 0.05 level of significance. Therefore the null hypothesis is rejected. Private school teachers are more prepared to address behaviors, issues, and challenges and better trained to handle children with ASD in the regular education classroom than public school teachers. The confidence and competence that the former possess can be attributed to their educational background with more of them (26.5%, n = 9) empowered by SPED trainings. According to Khan (2011), there are five types of challenges faced by developing countries in implementing inclusive education. These include a lack of relevant research information, inadequate support services, lack of appropriate facilities and materials, inadequate training programs, and ineffective policies and legislation.

 TABLE 3

 Significant Difference When Respondents Are Grouped According to Teaching Position

Indicator		WM	t	P – value	Decision	Remarks
	Teacher	3.34				
Knowledge of the	Head		1.842	0.070	Fail to	Not
Disorder	Teacher	2.92			Reject	Significant
					Ho	
Structure in the	Teacher	3.38			Fail to	Not
Classroom	Head		0.778	0.440	Reject	Significant
	Teacher	3.19			Ho	
Teaching	Teacher	3.22			Fail to	Not
Language and	Head		0.450	0.654	Reject	Significant
Communication	Teacher	3.12			Ho	
Teaching Social	Teacher	3.38			Fail to	Not
Competence	Head		0.772	0.443	Reject	Significant
	Teacher	3.18			Но	

Decreasing	Teacher	3.26			Fail to	Not
Problem	Head	2.96	1.190	0.238	Reject	Significant
Behaviors	Teacher				Ho	
Special Issues	Teacher	3.14			Fail to	Not
	Head	2.72	1.800	0.076	Reject	Significant
	Teacher				Ho	

Table 3 reveals that there is no significant difference among the six (6) competencies of teachers when grouped according to teaching position. The p- values are greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted. Head teachers and teachers have the same assessment of areas of strengths and weaknesses, and similar identification of areas in need of further professional development and support so as to successfully serve children with ASD. As stated by Mthembu (2009), successful implementation of inclusive education involves teachers who have the necessary knowledge, skills, competencies, and support to accommodate a wide range of diversity among learners in an inclusive classroom. School leadership is central in moving closer to a more inclusive society, and in terms of a child's experience of school life, leadership is crucial and complex (Ruairc, Ottesen, & Precey, 2013). As per Anwer & Sulman (2012), the school principal or the school leader has to ensure the success of an inclusive program with his or her backing. Billingsley, Mcleskey, & Crockett (2014) stated that school principals have a critical role in making schools an inclusive community that is responsive to the diverse needs of the students.

TABLE 4
Significant Difference When Respondents Are Grouped According to Highest Educational
Attainment

Indicate	or	WM	F-	P -	Decision	Remarks
			Value	value		
Knowledge of the	Bachelor's	2.98	.991	.377	Fail to	Not
Disorder	Degree				Reject Ho	Significant
	Master's	3.31				
	Degree					
	Doctorate	3.20				
	Degree					
Structure in the	Bachelor's	3.23	.258	.773	Fail to	Not
Classroom	Degree				Reject Ho	Significant
	Master's	3.32				
	Degree					
	Doctorate	3.70				
	Degree					
Teaching	Bachelor's	3.15	.307	.737	Fail to	Not
Language and	Degree				Reject Ho	Significant
Communication	Master's	3.17				
	Degree					
	Doctorate	3.70				
	Degree					
Teaching Social	Bachelor's	3.20	.624	.539	Fail to	Not
Competence	Degree				Reject Ho	Significant
	Master's	3.33				
	Degree					
	Doctorate	4.00				
	Degree					
Decreasing	Bachelor's	3.00	.682	.509	Fail to	Not
Problem	Degree				Reject Ho	Significant
Behaviors	Master's	3.22				
	Degree					
	Doctorate	3.70				
	Degree					
Special Issues	Bachelor's	2.78	.991	.377	Fail to	Not
	Degree				Reject Ho	Significant
	Master's	3.10	1			
	Degree					

Doctorate	3.30		
Degree			

Table 4 reveals that there is no significant difference on the six (6) levels of competencies of teachers when grouped according to highest educational attainment. The p-values are greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted. The results of the study show that majority (61.8%, n=21) of the teachers have not been adequately trained to teach children with special educational needs. All the respondents have general teaching qualifications, but only 11 (32.4%) of them have received training in SPED. Out of 34 teachers, only 16 (47.1%) had short-term (1–5 trainings) professional development training. Kapinga (2014) stressed the importance of trainings by stating that, "the success of inclusive education rests on quality teacher preparation gearing towards inclusive education. How teachers are prepared is intrinsically linked to the quality of education provided in the schools" (p. 2). Even though teachers reported that they were not adequately trained to teach children with ASD, the results confirmed that they have a satisfactory level of competency needed to teach these children. However, more training is needed to enhance their knowledge of children with ASD and evidence-based practices to enhance the learning experiences of these children.

TABLE 5

Significant Difference When Respondents Are Grouped According to Years of Experience in Teaching Children with Autism Spectrum Disorder

Indicator		WM	F-	P -	Decision	Remarks
			value	value		
Knowledge of the	1 - 5	1.55	5.725	0.000	Reject	Significant
Disorder	6 - 10	2.88			Но	
	11 - 15	3.59				
	16 - 20	3.48				
	21 - 25	3.71				
	26 and	3.00				
	above					
Structure in the	1 - 5	1.85	3.385	0.009	Reject	Significant
Classroom	6 - 10	3.17			Но	
	11 - 15	3.68				
	16 - 20	3.80				
	21 - 25	3.14				
	26 and	3.25				
	above					
Teaching Language	1 - 5	1.35	5.052	0.001	Reject	Significant
and Communication	6 - 10	3.06			Но	
	11 - 15	3.51				
	16 - 20	3.73				
	21 - 25	3.20				
	26 and	3.30				
	above					
Teaching Social	1 - 5	1.45	4.718	0.001	Reject	Significant
Competence	6 - 10	3.13			Но	
	11 - 15	3.64				
	16 - 20	3.95				
	21 - 25	3.37				
	26 and	3.25				
	above					
Decreasing Problem	1 - 5	1.35	4.672	0.001	Reject	Significant
Behaviors	6 - 10	2.90			Но	

	11 - 15	3.49				
	16 - 20	3.78				
	21 - 25	3.37				
	26 and	3.15				
	above					
Special Issues	1 - 5	1.40	3.881	0.004	Reject	Significant
	6 - 10	2.72			Но	
	11 - 15	3.36				
	16 - 20	3.38				
	21 - 25	3.09				
	26 and	3.10				
	above					

Table 5 reveals that there is a significant difference on the six (6) levels of competencies of teachers when grouped according to years of experience in teaching children with autism spectrum disorder. The p-values are less than the 0.05 level of significance. Therefore, the null hypothesis is rejected. Del Corro-Tiangco (2014) stated that the more experienced teachers have better appreciation of the teaching profession and have more conviction for professional development.

 TABLE 6

 Significant Difference When Respondents Are Grouped According to Number of Trainings

 Attended in Educating Children with Autism Spectrum Disorder

Indicator		WM	F-	P -	Decision	Remarks
			value	value		
Knowledge of	0	1.55	6.736	0.000	Reject	Significant
the Disorder	1 - 5	2.87			Ho	
	6 - 10	3.29				
	11 - 15	3.66				
	16 - 20	3.10				
	21 - 25	3.80				
	26 and	4.23				
	above					
Structure in the	0	1.85	3.719	0.003	Reject	Significant
Classroom	1 - 5	3.10			Но	
	6 - 10	3.53				
	11 - 15	4.09				
	16 - 20	3.20				
	21 - 25	4.20				
	26 and	3.60				
	above					
Teaching	0	1.35	6.422	0.000	Reject	Significant
Language and	1 - 5	2.95			Но	
Communication	6 - 10	3.36				
	11 - 15	3.94				
	16 - 20	3.32				
	21 - 25	4.60				
	26 and	3.49				
	above					
Teaching Social	0	1.45	6.241	0.000	Reject	Significant
Competence	1 - 5	2.99			Но	

	6 - 10	3.58				
	11 - 15	3.80				
	16 - 20	3.48				
	21 - 25	5.00				
	26 and	3.86				
	above					
Decreasing	0	1.35	6.488	0.000	Reject	Significant
Problem	1 - 5	2.79			Но	
Behaviors	6 - 10	3.33				
	11 - 15	3.74				
	16 - 20	3.30				
	21 - 25	4.80				
	26 and	3.83				
	above					
Special Issues	0	1.40	5.262	0.000	Reject	Significant
	1 - 5	2.59			Ho	
	6 - 10	3.18				
	11 - 15	3.66				
	16 - 20	3.16				
	21 - 25	3.80				
	26 and	3.60				
	above					

Table 6 reveals that there is a significant difference on the six (6) levels of competencies of teachers when grouped according to number of trainings attended in educating children with autism spectrum disorder. The p-values are less than the 0.05 level of significance. Therefore, the null hypothesis is rejected. Trainings that are specific to autism help in the teaching-learning process. If teachers were taught what to do when individuals with ASD exhibit challenging behaviors, then they would be empowered to address them appropriately and provide positive supports. Bayliss, Avramidis, & Burden (2000) mentioned that training affects the teachers' performance in the mainstreamed / inclusive classroom because trained teachers have more confidence in teaching children with special educational needs. The report published by European Agency for Development in Special Needs Education (2011) states "teachers need a repertoire of skills, expertise, knowledge, pedagogical approaches, adequate teaching methods and materials, and time if they are to address diversity effectively within their classrooms" (p. 4). Naicker (2008) reported that the teachers' lack of knowledge, skills, and experience of exceptional learners and mainstreaming has an impact on teachers' attitudes. Thus, it was recommended that they be provided in-depth knowledge of the philosophy of inclusion and pre-service and in-service training to accommodate students with special educational needs in the mainstream classes.

The problems encountered by head teachers and teachers in terms of their competencies when children with ASD are included in regular kindergarten classrooms are as follows:

HEAD TEACHERS	TEACHERS		
1. The provisions necessary for successful	1. KNOWLEDGE OF THE DISORDER		
implementation of inclusion / mainstreaming are	- No background or training in handling children with		
inadequate to address regular teachers' needs and	ASD		
competencies. Teachers in the regular classroom lack			
adequate competencies in handling children with ASD			
in the inclusive setting.			
2. One of the biggest challenges in the inclusive /	2. STRUCTURE IN THE CLASSROOM		
mainstreaming program for children with ASD is the	- Lack of visual aids, addressing the different needs of		
leveling and grouping according to their level of	children with ASD		

functioning as far as teachers are concerned. Teachers	- The child had difficulty adapting to his environment
need to be trained in the preparation of lessons and	when he is in a regular class.
materials as well as evaluation.	- Some of the students did not understand their
	behavior so we need to explain to them the situation.
3. There are general education teachers who tend to	. TEACHING LANGUAGE AND
be somewhat rigid with how they approach their	COMMUNICATION
students. As these kids have special needs, the	- It is difficult for the students with ASD to
approach must still be student-centered and	communicate with the teachers.
individualized. Some parents of the other students are	
not as open to having classmates who are in the	
spectrum. Hence, there are students who tend to treat	
their classmates with special needs differently.	
4. The child was not ready to be mainstreamed but	4. TEACHING SOCIAL COMPETENCE
had to be included in the regular classroom due to	- Children with ASD do not mind the other children
strong preference of parents and lack of available	that surround them. They are very sensitive when the
therapist to give one-on-one intervention. There is the	class in noisy, which triggers their tantrums.
issue of teacher readiness and competence to	- They experience bullying in the class.
differentiate instruction.	

HEAD TEACHERS	TEACHERS
	5. DECREASING PROBLEM BEHAVIORS
	- Problems in focusing, problems in behavior, and
	attitudes towards classmates
	- The child sometimes shouts, sometimes he behaves,
	sometimes does beyond what is expected, and
	sometimes does not follow instructions given
	- Giving instructions or commanding are always
	repeated twice or thrice before they will follow
	- Attention span; behavior towards peers
	- Varied changing of behavior or the constant changes
	of their behavior that sometimes hinder their learning
	capacity
	- I need to act like a clown or an impersonator to
	lessen their tantrums and to get their attention
	- The behavior of the children in different settings
	- Problems in addressing behavioral issues; needs
	more training
	- Handling short attention span and poor sitting span
	- Their sudden outbursts or mood swings during
	discussion time. It affects the focus of the other
	children and diverts their attention to the children with
	ASD. It sometimes leads to questions that somehow
	make the other children think one of their classmates
	is different from them.
	- The transition of the kids from mainstream to
	inclusion and their behavior
	- Self-management when tantrums are triggered and
	distract the class
	- Classroom management and application of applied
	behavior analysis as well as mode of instructions for
	the special children

6. SPECIAL ISSUES
- Sensory processing difficulties during snack time,
personal grooming, and artwork

The findings revealed that head teachers had a general view of the problems encountered when children with ASD are included in the regular classrooms, whereas, teachers enumerated the specific problems they encountered. Many (41.2%, n = 14) teachers stated problems in the behavior of children with ASD. This corroborates the results of the study conducted by Byrne (2012), which found that the most commonly reported barriers to including a student with ASD were behavior problems. Three (8.8%) teachers specified problems in teaching language and communication and teaching social competence. Two (5.9%) public school teachers admitted not having a background or training in handling children with ASD and stated problems in structure in the classroom. One (2.9%) teacher articulated problems in special issues.

## CONCLUSIONS

There are very few public and private elementary schools that include children with ASD in their regular kindergarten classrooms. There are very few teachers with teaching experience in educating children with ASD and who have attended trainings in educating children with ASD. In spite of the limitations, teachers have an overall satisfactory level of competencies in all areas, namely: (a) knowledge of the disorder, (b) structure in the classroom, (c) teaching language and communication, (d) teaching social competence, (e) decreasing problem behaviors, and (f) special issues. Private school teachers are more competent than public school teachers. Teachers with longer years of experience in teaching children with ASD are more competent and with more number of trainings attended in educating children with ASD are more competent. Problems in decreasing problem behaviors were ranked first, followed by teaching language and communication, teaching social computers.

### RECOMMENDATIONS

The Department of Education should encourage more schools to practice inclusion of children with ASD in the regular classrooms. It may start by consolidating the experiences of elementary schools that have implemented the inclusion of children with special needs and identify the barriers that have impeded other schools from following suit. Principals in the public schools and owners of private schools should further enhance the levels of competencies of teachers by providing professional development training, conference / workshop, and coaching, mentoring, or technical assistance by skilled professionals. Specialists such as occupational therapists, special education teachers, and speech-language pathologists may be invited to facilitate the training activities. The Commission on Higher Education must look into ways pre-service training programs could prepare future teachers to provide appropriate educational services to children with ASD and how to do so in an inclusive setting. Increasing the number of units in the Bachelor of Science in Elementary Education for special education subjects should be granted. Curriculum planners in the Colleges of Education in Higher Education Institutions should infuse evidence-based and competency-based autism interventions into the coursework. Parents of children with ASD should be provided training on the current trends and practices in the education of their children. They must be given an option to hire a private special education teacher to act as a shadow teacher in the regular classrooms. An information dissemination campaign to make teachers, parents, students, nonteaching personnel, and the community aware of the diagnosis of ASD should be organized by the schools that provide inclusive education to children with ASD. Teachers should structure the learning environment and create instructional materials for differentiated instruction to children with ASD. Administrators of schools must provide accessible facilities to children with special educational needs. Policy makers should address the needs of children with ASD and value the benefits of including these children in the regular classrooms. Parents of children with ASD should lobby for laws that would help facilitate the integration of their children in schools and involvement in the community. The government should increase the budget allocated to special education. Future researchers should design a study that will look into new technologies and evidence-based instructional strategies that will facilitate the successful inclusion of children with ASD in regular classrooms. Inclusion should be regarded as a responsibility to understand, identify, and break down barriers to participation of individuals with ASD in the school and involvement in the community.

## ACKNOWLEDGEMENT

Our thanks to Private Education Assistance Committee (PEAC), Trustee of the Fund for Assistance to Private Education (FAPE) for Dissemination Assistance for Research in Education, Paper Presentation Grant.

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# **Competency Framework Towards High-Impact Blended Learning Practices**

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# ABSTRACT

Conducting courses in Higher Education Institutions using blended learning mode is in great demand. Consequently, a lecturer also plays a role as an online instructor, described as blended learning instructor. He or she must be competent for high-impact blended learning practices as it is a foundation for an institution to provide quality courses that are relevant to current learning requirement and at the same time support the national education policy. However, blended learning instructors reported they do not have adequate skills, time and resources for blended learning and this indicates that competency gap is likely to persist. Hence, there is a necessity to develop a proper guideline to facilitate the learning instructors. The aim of this study was to develop a competency framework for blended learning instructors towards ensuring a high-impact blended learning practice at Higher Education Institutions. To understand the roles of blended learning instructors, the obstacles they faced including their needs to be successful and competent in conducting the BL, literature review was done and a conceptual framework has been developed from the findings. Recommendations were made on further actions to be considered by institutions in molding the blended learning instructors to be competent for the blended learning instructors.

Keywords: Competency Framework; Online Instructor; Higher Education; Blended Learning; e-Learning

# INTRODUCTION

Higher Education has been looking at possible best practices for designing blended learning environment (Bonk, Graham, Cross, & Moore, 2012) in response to various teaching and learning issues (Gedik, Kiraz, & Ozden, 2013; Lee, Yoon, & Lee, 2009; Zhang, Fang, Wei, & Wang, 2012) in higher education and to leverage the use of available learning technologies. However, literature shows that universities are still struggling with the implementation (Alebaikan, Troudi, & Calt, 2010; Moskal, Dziuban, & Hartman, 2013; O'Connor, Mortimer, & Bond, 2011).

The aim of this paper is to understand the roles of blended learning instructors, the obstacles they faced including their needs to be successful and competent for the blended learning implementation. To gear up the implementation, it is important to ensure the quality of delivery towards academic excellence with extensive use of this blended learning method, in line with rapid educational technology development. Hence, it is crucial for blended learning instructors to be competent and more prepared to adapt to global changes.

Most learners entering higher education nowadays have grown up in a world of information technology. They want to learn continuously and expect instructors to utilise the technology as well (Elham Akbari, Ahmad Naderi, Mahdi Hosseinzadeh Yazdi, Robert-Jan Simons, 2016) for the value and nurture their potential. A variety of electronic contents and communication media accessible via internet makes it easy for learners to access learning materials, collaborate with their peers and interact with their instructors, anytime and anywhere.

### **BLENDED LEARNING**

Bended Learning is basically a combination of face-to-face or classroom learning and electronic learning. Electronic learning or well known as e-learning allows teaching and learning process to take place through



web-based system via the Internet with no restrictions of time and place. This learning mechanism offers faster knowledge delivery and collaboration opportunities if both the learner and instructor are committed, cooperative and understand how to organise it well. Formerly, conventional method that is more towards one-way educational process between lecturers and students were in practise. The presence of the Internet and multimedia technology has reduced the dependence on conventional teaching and learning which was only done through classroom or face-to-face teaching. Teachers who used conventional methods are usually more exam-oriented and aimed to finish the syllabus prescribed. Generally, this method is no longer acceptable by most higher learning institutions even though it is still being practised by some.

Earlier defined by Garrison & Kanuka (2004), blended learning is a thoughtful integration of classroom face-toface learning with online learning experience. Later redefined by Moskal, Dziuban, & Hartman (2013) that in most standards, blended learning is a mechanism that bridges the old and the new learning process by impacting policy and strategic initiatives in higher education at virtually every level. Authors also emphasised that successful implementation of blended learning program demands an alignment of institutional, instructors, and student goals.

Blended learning recognises the strength and weaknesses in both online and face-to-face learning environment. It merges the strengths in both method and minimise the weaknesses of each by applying the other method; most weaknesses in face-to-face will be overcome using the online method and most weaknesses in online will be covered by the face-to-face method. However, both learner and instructor play a strong role towards the success of this blended learning method (Eom, Wen, & Ashill, 2006; Varela, Cater, & Michel, 2012).

With respect to the instructors' roles, summary of the key roles adapted from Salmon (2000) is shown is Table 1. By understanding these roles, blended learning instructors will be motivated and have a clearer path to plan for blended learning lessons, evaluation and communication.

No	Roles	Description					
		To be expert in content, provide focus to learner and being a role model in					
1	Confident	understanding the online process, technical skills, courteous in face-to-face and					
		online communication, and motivated as blended learning instructor.					
		Encourage contributions from learner, speak and write concisely and energizing					
2	Constructivo	online messages, appreciate the feature of learning management system (LMS),					
2	Constructive	able to establish good online profile and capable to build online trust and					
		purpose.					
		Trigger debates through intriguing questions, able to adapt new teaching					
3	Developmental	methods, know how to use and control LMS, able to engage learners during					
		face-to-face session and via online, ready to take feedback and foster discussion.					
		Help to bring non-participants and control groups of learners, show sensitivity to					
4	Facilitating	online and offline communications, responsible in awarding marks fairly to					
		learners and able to assist learner in using technology during learning.					
		Provide link to related valid sources, value learners' diversity with cultural					
5	Knowledge	sensitivity, know how to explore ideas, promote valuable treats, close off					
5	Sharing	unproductive treats, establish/support a learning community and continuously					
		show positive attitude and commitment in teaching and learning.					
		Create an encouraging, relevant online learning community, able to					
6	Creative	communicate effectively and create a positive learning environment, know how					
0	Cicalive	to structured activities to wheeling discussions, to able to evaluate the success of					
		learners in holistic view via online lesson and face-to-face session.					

Table 1: Roles for Blended Learning Instructor, Adapted from Salmon (2000)

Even blended learning is frequently awarded as a great method of learning; there are still concerns inclusive of readiness, instructors' competencies and resources. The costly high failure rate of online learning implementations deserves attention from institutional management (Arbaugh, 2014; Arbaugh & Duray, 2002). Studies found that important issues among lecturers who did not apply blended learning, were due to lack of knowledge, lack of an enabling environment, lack of support and no policy in place (Tshabalala, Ndeya-Ndereya, & Merwe, 2014). Previous research also found issues related to instructors such as lack of time, lack



of interest, lack of co-operation and inappropriate compensation system (Mihhailova, 2006). In fact, the coordination between face-to-face and on-line learning are still debatable (Gedik et al., 2013) while it is a very important aspects for the instructor to be competent in managing the learning processes.

To become competent in blended learning is like to master the teaching using face-to-face method and this requires them to be competent in online method via the synchronous and asynchronous techniques while at the same time balance between knowledge discipline, technology and pedagogy.

Despite recent research in online instructor's competencies (Baran, Correia, & Thompson, 2013; Darabi, Sikorski, & Harvey, 2006; Diehl, 2016; Smith, 2005; Spector & de la Teja, 2001), studies are still lack of necessary focus on blended learning instructors and their performance outcomes in blended learning implementation.

# HIGH-IMPACT PRACTICES

High-impact means able to affect or influence someone or something in a powerful way. In the blended learning competency matter, powerful can be translated as having a lot of strength to control the learner and the learning environment. Moreover, applying high-impact blended learning practices allows an instructor to transform the knowledge and experience sharing to be significant and useful.

Focusing on the blended learning instructor's role in achieving the targeted outcome of education and retains learner, it is crucial for them to be competent in developing and executing a high-impact blended learning practices. Hence, it will grab the interest to engage the learner, increase understanding, build a better relationship and the outcome will be more valuable for the learner.

The steps describes by Bersin (2016) on how to develop a high-impact learning culture which may be adapted in executing the high-impact blended learning practices are summarised in the following points:

- 1. Continuous learning as part of competency development.
- 2. Learning is part of culture and everyone to take ownership of the learning.
- 3. Captive audience to be fully utilise to make it interesting and worthwhile.
- 4. The first impression must be great and personally benefits individuals.
- 5. Allows people to reflect on how they learn by putting them to practise on real situation
- 6. Provide incentives and opportunities for knowledge sharing.
- 7. Redesign the performance management to allow it become a driver of development.

All the listed steps have their strength in contributing to the high-impact blended learning practices. However, the most important point that facilitates others is the seventh steps; redesign the performance management which will require a specially designed competency framework for blended learning and appropriate measurement tool to be in place. Henceforth, the high-impact practises will be able to take place and nurtured.

# **COMPETENCY FRAMEWORK**

Competency is referred as having enough skills or knowledge to do something well or at the necessary standard (*Oxford Advance Learner's Dictionary*, 2010) and it can refer to either individual or organisation. European Parliament and Council in 2006 (INTEF, 2017) has defined competence as combination of knowledge, skills and attitudes adjusted to a context. This is appropriate as these three elements are slightly different and rely on each other. For example, having the *skill* to complete a particular task will require good *knowledge* on the impacts and positive *attitudes* to conform to the pre-defined procedures. As a result, the person is meeting the necessary standard of the executed action and chances for success is high compared to those without these three attributes.

Early this year, comprehensive framework namely common digital framework for teachers has been released by National Institute of Technology and Teacher Training, Ministry of Spain (INTEF, 2017). Regardless the framework clearly referred to the digital competence for teachers, this framework is concentrating on the required skills to conduct an online teaching. It is not complaisant enough to be adopted for blended learning instructor in Higher Education Institutions as the demand is for them to be competence in both face-to-face and online teaching. Thus, it will be best to combine the framework with few others competencies models that include attitudes and knowledge like what has been proposed by Darabi, Sikorski, & Harvey (2006), Dobbins & Crocker (2002), and Salmon (2000). Those models comprised of other dimensions inclusive of psychological elements which are highly required in pedagogical dimension for teaching adult learners. To make it more

structured, several validated teaching competencies proposed by Darabi, Sikorski, & Harvey (2006) will be used as a backbone to segregate the competencies into phases inclusive of preparation, execution, monitoring and reporting. Apart from that, collaboration is recommended to take place in every single phase and risk management will support the blended learning implementation process.

## Preparation

Before the instructor actually starts to execute the blended learning, preparation has to be made. Table 2 summarise the competency categories discussed by Diehl (2016) which was earlier proposed by Jurgen Hilke in 2012. These attributes are relevant and important to be understood by the instructor during the preparation phase. Having these competencies attributes will allow them to establish a comprehensive planning and preparation to accommodate the blended learning process.

Knowledge in adult education (Dobbins & Crocker, 2002) is a basic competency as it is crucial for the instructor to understand the goal of teaching and have a clear direction on what to achieve. By having a clear understanding of the learning theories, techniques of learner centred are able to be practised where necessary adjustments might be applied to the intended audience.

In order to implement a high-impact blended learning, instructors need to be adequately prepared with the necessary competencies. It is crucial to incorporate their roles with the associated competencies into a comprehensive and effective blended learning process. Hence, analysis on the planned approaches and contents can be done to determine the effectiveness.

No	Competency categories	Description
1	Institutional	Understand the institutional context in which the instructor's attach to, inclusive of academic policy, student policy, evaluation policy, academic integrity, and
1	context	other related policies.
2	Technologies	Knowledgeable about technologies used to support the online and classroom
	-	lesson
3	Instructional design	Understand the instructional design requirement of the course and environment
5	mstructionar design	for online and face-to-face session.
4	Dedeeser	Understand the pedagogical components of the face-to-face and online teaching
4	Pedagogy	and learning process.
5	Assessment	Knowledgeable about various methods to assess the outcome of teaching and
3	Assessment	learning in face to face and online method.
6		Establishes a social presence and communicates effectively in classroom,
0	social presence	through writing, online chatting and other medium like audio and video.
7	Discipline	Become an expert in their own discipline to ensure for good and confidence
/	expertise	knowledge delivery.

Table 2: Competency categories for blended learning

# Execution

The digital framework for teachers (INTEF, 2017) comprises of five digital competence areas as summarised in Table 3. This framework is suitable to be adapted especially during the blended learning execution phase. All the competence areas are essential to effectively execute the teaching activities. For each of the competence area, details of skills and ability can be measured according to its level of proficiency level; beginner, intermediate and advance.

Table 3: Most relevant skill based on digital competence area proposed by INTEF (2017)

No	Competence area	Details					
1	Information and data literacy	Able to identify, locate, store, organize and analyse digital					
1		information.					
2	Communication and collaboration	Able to communication via online method and have intercultural					
4		awareness					



3	Digital Content Creation	Able to create and edit new e-contents, understand multimedia contents, able to apply the intellectual property rights and use licenses.
4	Safety	Use of security, protection of digital identity, data protection, and sustainable use.
5	Problem solving	Able to identify digital needs and resources, creative use of technology, make decision when using appropriate digital tool and able to solve conceptual and technical problems through digital media.

In this execution process, design and delivery of teaching and learning activities play an important role (Dobbins & Crocker, 2002). Instructors to execute the planned strategies towards goal achievement, facilitates individual learners and group learning. Instructors also should be able to build learning on own and learner's previous experience while utilising reliable and variety of sources. They also should be able to use technology to develop materials and to engage learners and encourage learners to move towards higher order thinking for problem solving. Communication opportunity either via face-to-face or technology media should be fully utilised to promote understanding and knowledge generation (Bigatel, Ragan, Kennan, May, & Redmond, 2012; Dobbins & Crocker, 2002).

### Monitoring and reporting of teaching and learning activities

After the blended learning main delivery process, instructors should be able to monitor the goal attainment, communicate anticipated outcomes prior to beginning of the course, ensure the compliance of the requirements for record keeping and establish a systematic process for collection outcomes from learners and properly disseminate feedback to them (Dobbins & Crocker, 2002).

### Collaboration

Collaborations generally support towards increase in resource collection, resource enrichment and indirectly promote peer sharing among adult education (Dobbins & Crocker, 2002). Effective instructors should be able to build a relationship with all the stakeholders to facilitate and improvise their service delivery starting from the preparation phase, in the midst of execution phase and during the monitoring and reporting phase.

### **Risk Management**

The risks faced by Higher Education Institutions are diverse and the loss potentials is enormous (Bubka & Coderre, 2010). To control the risk of unsatisfied learners which might lead to bad consequences, it is important for the blended learning instructors to understand their learners to ensure that the learners are satisfied without compromising the learning objectives. If the learners have an issue or not satisfied, it has to be investigated in order to understand the contributing factors. In gathering the desired information with respective evidence, a procedure must be in place. This will help to determine what had happened, when and who were involved in the identified issue. The level of severity for the identified issues should also be classified to plan and justify the corrective action. Finally, necessary changes should be made and monitored accordingly. There mechanism describes the basics of risk management to be embedded with the required competencies for blended learning instructors which will aid them in the decision making process and eliminates the issues that may arise.

Risk management will involve investigation, analysis and prioritisation of an issue related to teaching and learning process inclusive of learner's satisfaction and necessary improvement on competency components. This will help in identifying appropriate corrective actions in order to ensure that high-impact blended learning practices are achieved and under control.

Apart from that, to proceed in blended learning implementation and to keep the motivation of the instructors intact, the risk management strategy should also be in place to support the preparation and execution of blended learning. Once the risks are identified and mitigated earlier, chances for issue to occur during the implementation will be lesser and this will make both learner and instructor happy and psychologically motivated in continuing with this blended learning method. Currently, no prominent studies have incorporated risk management as one of the required competency attributes by the blended learning instructor. Hence, it is an opportunity and necessary

to include the risk management attribute in the competency framework for blended learning instructor. Moreover, flexibility in meeting unexpected circumstances can be demonstrated when the risk management is incorporated in the same framework. The proposed framework is shown in Figure 1 below.



Figure 1: Framework for Competence Blended Learning Instructor

# RECOMMENDATIONS

Action need to be considered by institutions in molding the blended learning instructors to be competent in the blended learning implementation. Challenges faced by them must be identified, analysed, prioritised and immediate action for mitigation and control activities must be in place without further delay. Despite developing the necessary competencies for instructors, other supports for the learners and instructors such as reliable and robust infrastructure must also be in place. For monitoring and control, it is important to track the result of blended learning implementation through continuous evaluation on students, instructors, and the institutions (Moskal et al., 2013).

In terms of evaluation, to warrant that there is a standard blended learning practices to measure the instructor, appropriate evaluation tool is in need. This will allow for fair and consistence self-evaluation or evaluation by other stakeholders. Nevertheless, we could not avoid various facets of human performance measurement that might intervene the measurement process (Bond & Fox, 2015). Therefore, it is recommended to consider for reliable measurement tools that will be able to measure their competency based on the other factors such as locations, courses and the measured competency items. For instance, Rasch Model could aid to measure the probability of success depending on the difference between the ability or competency of the person and the difficulty of the item (Bond & Fox, 2015).

# CONCLUSION

Blended learning instructor framework is a set of competencies that educator need to develop in order to practise a high-impact blended learning implementation. The framework outlined in this study may assist blended learning instructors and institutions to determine targeted competencies for their professional development programmes. With the framework in place, the strength, weaknesses, opportunities and threats in blended learning may also be identified for the purpose of analysis and decision making. When instructors are occupied with appropriate competency, their expertise can be easily shared with the learners and they will be able to manage and control any challenges along the teaching and learning process effectively.

Generally, this paper represents the framework that can be used in the operational and strategic plan. It also added risk management attributes which are important but have not been discussed in other literature pertaining to the same matter. Framework has integrated necessary competencies in preparation, execution, monitoring and reporting, collaboration and risk management, to be mastered by blended learning instructors, who hold a major responsibility in the blended learning implementation. These concepts shall be mastered as earlier as possible to assist in the blended learning process while managing the possible risks before and along the process. Apart from that, the framework may serve as the basis to develop a measurement tool to access instructor's competency that can be utilised by the institution for needs analysis and development of competent blended learning instructor. **REFERENCES** 

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# **Construction and Integration of Ict into Distance Education**

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## ABSTRACT

Integrating Information and Communication Technology into teaching has become the norm of the century due to the influx of electronic gadgets, massification, inadequate traditional equipment and learning space. This study focused on the guidelines necessary for the construction and integration of a traditional course onto a web-based platform for distance learners who were engaged with an e-platform. The distance learners indicated that the e-learning mode helped them in acquiring more skills in the use of technology; and more importantly giving them the opportunity to study while working. Though Faculty expressed their views on how their expertise to design and develop courses using instructional design principles were enhanced, they still battled with time to construct the e courses. It was recommended that research into perceptions of Faculty about new technologies in teaching and learning could provide useful ideas into changing academic roles and inform institutional policy on online education and staff development. An example of an integration plan was attached.

Keywords: Distance education, design guidelines, ICT integration, moodle

### INTRODUCTION

The sudden surge of information and communication technology (ICT) has led to easier, faster and more reliable communication all over the world, such that the world now appears smaller and more connected than before the 1990s. ICT is a tool, which refers to various resources and tools presented on the computer, in educational circles. It enables teachers and learners to link other learning communities in diverse ways. The internet for example, provides those living in rural areas with access to services that they may not have in their own communities. Digital environments provide both the technology and opportunity to liberate people from limitations imposed on them by geographical locations, disability, ethnicity, gender and age. In educational circles, ICT has been observed to be potent in forging collaboration, enhancing adult and self-learning and ensuring that connectivism is practised (Rowley & Hartley, 2008; Salmon, 2002). It also enhances learners' motivation, links them to enormous sources of information, and allows teachers more quality time for facilitation (Roblyer, Edwards, & Havrilule, 2004).

Technological progress and innovation have generated changes in how knowledge is acquired, exchanged, and communicated. This has diversified the acquisition of knowledge at higher institutions, as some have shifted from the traditional classroom studies to open modes of digital learning. Some of the possible examples of Instructional technology are the e learning courses and the distance education courses of today. In addition to potentially enhancing learning in the classroom, technology can also enable students to receive instruction remotely through distance education or online learning. Distance education may include videoconferencing and televised or audiotaped courses, but Internet courses (hereafter referred to as online learning) are the most widespread and fastest-growing mode of delivery (Queen & Lewis, 2011). Online learning programs range from programs that are fully online with all instruction occurring via the Internet to hybrid or "blended learning" programs that combine face-to-face teacher instruction with online components (Picciano & Seaman, 2009; Staker & Horn, 2012; Watson, Murin, Vashaw, Gemin, & Rapp, 2012)

This is the case of distance learners at the University of Education, Winneba who by virtue of their working schedules as well as their location are able to access education at the higher level. UEW distance education learners experience the blended learning programmes that combine face to face teacher instruction with online components. Digital technology plays a key role as a supporting pedagogical tool. In digital environments, learner autonomy is highlighted as it can provide course content and a variety of learning styles which could suit individual needs (Yang S. , 2006). Thus, the former 'all knowing' teacher presence is not required. The teacher basically now serves as a facilitator.

The main role of integrating technology in education is to assist learners to acquire skills and knowledge through interchange, interaction, and group work. Integrating ICT is often mistaken as wholly taking one's lesson, topic or curricula and uploading them and after that, using the computer to teach or display the information (OPNZ, 2014). Others oftentimes type their text or scan it for display by means of their laptop and a projector. ICT integration, however, is the process of using ICT to enhance student learning in more interactive and extended ways (Willams, 2003). Integration, at best, could be done on micro levels (lessons) for trials and then progressed into integrating whole lessons (macro level) for teachers to adequately develop the required skills needed for smooth integration and supplement student learning. Through micro and <u>macro</u> skill development, an institution could go on large scale project of integrating ICT into their entire curriculum. Using ICT to support an institution's entire content and learning experiences of a whole course would be seen as integration on a macro scale (Wang & Woo, 2007).

Using technology to teach is as old as radios, and then later televisions (Cuban, 1986). Electronic learning (elearning) is pedagogy enhanced by technology. It is a combination of well-designed web-based learning experiences through skilful facilitation. The term, 'e-learning' originated in USA, where it was defined as the process by which a learner applies digital media, including internet, computers, satellite broadcast, audio, videotapes, compact discs and interactive television in their teaching process to facilitate student learning (Yang & Yenb, 2016). This suggests that e-teaching is also practicable. According to Hativa and Goodyear (2002), in order for academicians to adapt to an increasingly diverse heterogeneous student body in institutions, there will be the need to find new teaching methods, modes, technologies, change in roles, conceptions and practices.

In Ghana, computers, laptops, palmtops and mobile phones are in vogue and employed to enhance social and business communications and recently, teach and learn. ICT in education employs instructional methods such as animations or simulations to enhance understanding of many conceptual and abstract phenomena. When used effectively, it engages learners in an exciting way so that learning becomes 'less burdensome'. It motivates and challenges their innate capabilities, so that learning becomes a construction of one's own knowledge based upon tested assumptions. Students thus develop reflective, process and concept skills. Teaching in an online environment induces a paradigm shift for teachers and students alike. One would have to consider the skills requirements, rights and responsibilities of teachers and learners, conduct and etiquette.

Technology affords changes in pedagogy and content knowledge as teachers shift perspectives on what knowledge is valued and where the knowledge is obtained. It enables a focus on student-centred learning, with learners engaging in different tasks that are often inquiry-based rather than focused on a finite set of content points (Dikkers, 2015). Furthermore, it empowers students and reforms their ideas about education. According to Amaral and Shank (2010) blended or hybrid learning enhances student cognition and retention as visual images and sounds are remembered so that proper mental models could be built. Students learn better when corresponding words and images are presented simultaneously, rather than successively. Best use of audio and video channels or animation and narration must be learned and employed by teachers. Constant use or practice will improve learning and transfer of knowledge.



### Pre-requisites to planning a model

With all the social and educational benefits of ICT and e-learning in particular, moving traditional courses online must become a prime objective for all academic institutions. Moving a course online is not a matter of chunking one's old teaching material up into pieces and mounting them. Many considerations have to be made. For example, materials have to be sequenced to facilitative progressive understanding, while avoiding work and cognitive overload. At the same time, students must enjoy the social aspect of e-learning through collaborative work or discussions and yet interact with teachers directly by means of reflective journals or chats in a safe, secure, digital environment. One other important requirement for effective integration of ICT would be to provide technical help and experts when necessary for learners. Teachers would also have to shift roles from their former focus on content delivery to varied responsibilities such as being facilitators, integration specialists and instructional technology researchers. Some instruction designs such as Salmon's (2002) 5-stage model, Laurillard's (2009) model on how to collaborate technology with traditional learning, and Kanuka's (2005) model on how to integrate diverse instructional strategies on the e-platform could be employed. These models present design guidelines for incorporating various resources and tools into e-activities. Teachers would have to be aware of learning theories such as those of the constructivists, behaviourists, associationists, cognitivists, situationists, connectivists, andragogists, and other modern theories so that the best paradigm for their course of study and anticipated activities could be employed as they build their e-courses. Cultural needs, access to internet, access to hard and software, the teacher's own role and online presence would have to be taken into consideration (Shank, 2005). Many more things such as whether facilitation would be synchronous, asynchronous or a blend of the two would be required (Anyangwe, 2012).

E-examples are developed to give students opportunities to practise and learn in active ways so as to test their knowledge and prepare for examinations. It allows for self-studies during and outside class. These e-exercises or e-examples can support active learning over a wide range as they expose students to variety of tests and learning formats. More interestingly, learners get immediate feedback. For teachers or facilitators, feedback is given in real or delayed time as desired. Maintenance cycle is short and distribution is easy.

### **PROBLEM STATEMENT**

The University of Education, Winneba expanded its student enrolment and had challenges with infrastructure and time tabling of courses. Thus, it resorted to a hybrid inline tuition to relieve itself of the self-imposed burden while students get increased access to knowledge in a diversified and innovative way. Its main challenge, however, was how to convert its traditional teachers to e-facilitators. The task of the traditional lecturer is shifting from the transmitter of information to the management and facilitation of student learning. These to-be e-facilitators had little or no knowledge on how to create an inclusive engaging learning environment online, to ensure that both they and their distant learners have the requisite skills as well as the awareness of comfort in a digital world.

### **RATIONALE FOR THE STUDY**

The changing phase of education, increase in student numbers, a change in curriculum, teaching loads and assessment loads all suggest a change in the teaching and learning process. Thus, more flexible, responsive open and yet inclusive programmes, besides the need to teach differently favour the integration of ICT into modern classroom lessons (McShane, 2004). The introduction of ICT is also a response to a worldwide move to develop integrated educational technology. ICT could also facilitate the exposure of students to the large body of detailed information on education. The possible approaches could be in hybrid mode or full online mode.

### PURPOSE OF THE STUDY

Social expectations, institutional vision and mission, and the desire to align one's institution with external world expectations puts demands on academics. The purpose of this study was to explore the feasibility of constructing and integrating a hybrid moodle approach into a distance learning study program and to find out challenges that students and Faculty could face in the use of this medium.



### **RESEARCH QUESTIONS**

- 1. What challenges did Faculty face in the design, construction and integration of the integrated e-courses?
- 2. What challenges did Faculty experience during the execution of their e-courses?
- 3. What are students' perceptions about using e-learning platform as a learning tool?
- 4. What was the impact of the integration of e-course on Faculty?

### METHODOLOGY

The exploratory research design was employed because the study was focused on gaining insights and familiarity for later investigation. It was to find out about problems or otherwise of the moodle in its introductory stage (with distance learners) and Faculty members' impressions about its integration.

Five lecturers who were into the use of the hybrid moodle software were conveniently interviewed while ten students were purposively sampled and interviewed from a population of nine (9) and nineteen (19) respectively. The instruments used were analysis of online documents and semi-structured open ended interview schedules (see Appendices B and C). The importance of learning theories and their implications on student learning were reviewed. The Moodle was chosen for use by the institution under study because it is an open source learning.

### **Directing objectives**

Faculty had to understand their own personal theories and their limitations. They had to understand how good theories, particularly andragogy, would enable them to provide story lines for novice course designers to build instructional strategies and students to build sound conceptions. Besides, learning theories help teachers to understand themselves and students better. Faculty were also taken through the nuts and bolts of the e-learning process (Anderson, 2008). Some of the necessary criteria were:

- 1. who learners for a course were and their needs analysis
- 2. where and how our learners would apply knowledge; implying thinking through themes and context
- 3. creating learning activities on what learners should be able to do
- 4. creating assessment activities on how achievement of objective will be demonstrated
- 5. deciding the appropriate tools and media that would support activities to be incorporated
- 6. using warm, inviting, and inclusive motivational language
- 7. putting the course together
- 8. evaluating the course to see how it works

The model for designing the integration of ICT for the University of Education (UEW) was simple and sequenced. It allowed designers to construct their e-platforms to include resources and activities only after a label was given to each lesson, topic, unit or module. A structure of practical guide lines for use by Faculty is presented as Appendix A. To begin with, interested Faculty members were trained for two weeks intensively to develop course manuals as a pre-requisite to building e-courses/ lesson and lecture notes were also developed. Within the lessons and notes, web-links and e-activities were embedded. Some of these were synchronous while others were time-delayed and asynchronous. Total available hours for the e-study was calculated and apportioned over teacher-time, student-time and collaborative activities. Provision of academic and technical help were made a core need for each lesson. The moodle platform was the institution's choice of LMS as it was easy to use and could be accessed freely online. Obtained data was analysed descriptively into experiential themes in order to bring out the strengths and weaknesses of the desired LMS and users' challenges.

### RESULTS

Table 1 shows some of the observations that students reported on during an interview session



### Table 1

Students'	observations	on the use o	f the	Moodle	platform	in learning

	Finder and the second finder and the second finder and the second field of the second					
	Students' positive opinions	Students' challenges				
1.	Increased engagement with course content	Meeting timelines				
2.	Exposure to variety of learning materials	Inadequate ICT skills				
3.	ICT competence enhances	Interruption in internet supply				
4.	Vivid images increased conception	Interruption in power supply				
5.	Collaboration was enhanced	Hesitation to explore Moodle				
6.	Communication skills improved					
7.	Exposure to different teaching methods/styles					
8.	Research skills enhanced					
9	Enhanced reflection					
10.	Enhanced cognition					

From Table 1, it could be seen that students' positive opinions outweighed their challenges. Two of the challenges were beyond their means; interruption in power supply and internet supply. Though some were of the view that they were pessimistic about the success of the use of the e platform for the course of study initially, they could now appreciate its relevance. Some indicated that the e-learning mode helped them in acquiring more skills in the use of technology. All the students interviewed did not hide their excitement on the fact that the e-learning platform employed by the University actually had given them the opportunity to pursue their education.

Faculty were also interviewed and their observations are presented in Table 2.

### Table 2

Faculty members' observations on building and using e-courses

	Faculty's positive opinions	Faculty's challenges
1.	New pedagogies learned	Time constraints for construction
2.	Increased writing skills	Interruption in power supply
3.	Easier administration of assessment	Interruption in internet supply
4.	Rapid feedback on assessments	Revision of learning theories required
5.	Easy tracking for system of students' progress	Balance between technical demands
		and pedagogical goals
6.	Enhanced communication skills	Loss of roles
7.	Exposure to different teaching methods	
8.	Enhanced research skills	
9.	Good platform for getting all students aboard	
10.	Possibility of worldwide teaching and learning	
11.	Observable intellectual growth among students	

From Table 2, it is observed that though Faculty admitted that building an e-course requires a lot of time its benefits are many. Faculty indicated that the construction of their courses using moodle enhanced their technological skills which eventually made their work a bit easier. This is because it made the administrations of students' assessment easier and feedback on assessment rapidly given to students. Though some faculty members indicated how challenging it was to construct the e courses, they were motivated to revise and learn new theories which helped in the construction of the e courses. They confirmed how relevant the integration of ICT is to their profession now, considering how advanced teaching and learning had evolved with technology and to be able to reach their students wherever they find themselves (Hativa & Goodyear, 2002).



### CONCLUSION

Use of digital educational technology improved among Faculty and students alike. Faculty's expertise to design and develop courses using instructional design principles were enhanced. They gained knowledge in andragogy and were able to plan for the working adult category of learners better. The choice of dedicated Faculty for training was one big factor that saw the completion of this study to the end. There was a paradigm shift in favour of student-centred learning. Students also developed research skills and better conceptual models of many scientific concepts.

### RECOMMENDATIONS

Teachers are engines for change but will require time, support and space to use technology in innovative ways to change their classroom roles in a significant way. Research into perceptions of Faculty about new technologies in teaching and learning could provide useful ideas into changing academic roles and inform institutional policy on online education and staff development. It is therefore recommended that a balance between technological demands and pedagogical goals are created. This would help create a platform where all lecturers would think more on using technology to enhance instructions with the appropriate pedagogy in achieving the best results to satisfy the diversity of students. The internet connectivity of the University could be boosted to help reduce the challenge some of the students face in accessing course instructions online.

Again, the offer of remuneration could encourage more lecturers to avail themselves for training and use of online courses in institutions. In-depth course and student evaluation for improvement of content, structure and e-tivities is recommended.

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### Appendix A: A sample of an ICT integration plan

# Appendix B: Semi-structured interview items for students

- 1. What are some of the positive gains that have been made by you with the introduction of the moodle or e-learning platform?
- 2. Did e- learning particularly affect your engagement with your course content?
- 3. How about its effect on your interaction with your teacher and colleagues?
- 4. How else did it impact on you as a distance learner?
- 5. What challenges did you face?

### Appendix C: semi-structured interview items for Faculty

- 1. What are your opinions about the integration of ICT into UEW's curricula?
- 2. How easy was it to integrate the moodle into your course?
- 3. How easy/difficult was it to build and use the moodle? Appropriate construction qualification?
- 4. What comments would you make with respect to online assessments?
- 5. What other comments would you want to make about the construction and integration of ICT into UEW's curricula for distance learners?



TOJET: The Turkish Online Journal of Educational Technology – December 2017, Special Issue for ITEC 2017144 Construction and Validation of Mathematics Achievement Motivation Scale (MAMS) for Senior Secondary School Students in Nigeria.

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# ABSTRACT

consideration of the importance of Mathematics and the desire to alleviate the rate of failure in the subject, this study set out to construct, establish the reliability and validity of the Mathematics Achievement Motivation Scale (MAMS), a self-report instrument was designed for use among senior secondary school students in Nigeria using a survey design. The respondents were randomly selected among Senior Secondary School two from the six geo-political zones in Nigeria. The reliability of the instrument was measured using Cronbach's Alpha which was reported to be 0.89, the reasonable factorability of the entire items of MAMS provided adequate basis for empirical examination using Kaiser-Meyer-Olkin (KMO) and Barletts Test of Sphericity which also confirmed high validity, KMO measure of sampling adequacy was .87, which was above the recommended value of .6 which was also significant at X(1219) = 5.807, P<0.05). The extracted factors of the eigenvalue after the ratios contributed about 84.38% of factors required to explain the items. The communalities ranged between .651 and .859 in which each item showed the degree of common dimension of the items while the factors loading ranges between .666 and .877. The instrument correlated well with Mathematics Motivation Scale and Mathematics Achievement Test at 0.94 and 0.89 respectively which connotes high criterion and predictive validities. The fit model that was derived really substantiated the relationship among the variables. All the two hypotheses were test at 5% level of significant. The implementation of the use of this instrument in Nigerian secondary schools will drastically reduce the rate of failure in Mathematics because it is both diagnostic and prognostic.

Keywords: Construction, Validation, Achievement Motivation.

# BACKGROUND TO THE STUDY

Learning involves a relatively durable change in behaviour especially in the classroom setting which can be used to measure learning outcomes (Ilogu, 2005). Mathematics is a core subject that requires that all students at both primary and secondary must have qualitative learning of it. Though, there are many

variables which often influence these changes, thse include learning environment, teachers' instructional methods, learning strategies, students' expectation of their own performance, expectation of parents, attitude towards learning, determination to succeed, achievement motivation among others. Among these variables, the motivational ability inherent in the individual is of paramount importance (Weiner, 1999). The achievement motivated students therefore seek achievement attainment of realistic but challenging goals and advancement in school subjects like Mathematics to enable them actualize their dreams in life.

Studies have shown that some people are highly motivated to succeed and expend considerable effort striving to excel. Examples of abound in history. For instance, there is like Kanu Nwankwo, a Nigerian footballer whose remarkable recovery from heart surgery was capped by being voted as African footballer of the year and the British Broadcasting Corporation's (BBC) African Footballer of the year (BBC Sport 1999 Jon Krakauer, an American whose laborious and grueling effort to reach the summit of Mount Everest in May 1996 despite the death of some other contestants, Sampson Davis, Rameck Hunt and George Jenkins also exemplified their desire to achieve and thereby strove to become doctors (Passer & Smith 2004). Although, most students are keenly aware of society's emphasis on achievement, whether in academics, sports, music or other fields through personal effort and abilities to attain their goals but individuals differ in their achievement motivation, those who are not as motivated to succeed do not work as hard to achieve.

Weiten (2007) asserts that achievement motivation involves the need to excel, especially in competition with others. He also opined that people who are relatively high in need for achievement work harder and more persistently than others. Studies have made several attempts to derive some instruments to measure achievement motivation. Examples of such instruments are: Achievement Motivation Scale (AMS) by Shah (1988), Mathematics Strategies for Learning Questionnaire (MSLQ) by Pintrich, Smith, Garcia and McKeachie, (1991), Achievement Motivation Profile (AMP) by Friedland, Mandel and Marcus (1996), and Student Motivation Achievement Learning Strategies Inventory (SMALSI) by Stroud & Reynolds (2005).

The need to measure achievement motivation in students cannot be overemphasized as this is a crucial exercise that needs adequate attention in order to enhance students' performance.

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Artendership-oriented teacher sets challenging goals, has high expectations of students, and displays confidence that students will assume responsibility and put forth extraordinary effort. The process of measuring involves cogent variables such as: the characteristics of achievement motivated students, locus of control, efficacy, attitude of teachers, parental expectation and the expectation of the students. Omoegun (1995) identified the home and family background as a major cause of maladaptive behaviours, while discussing adolescent crises, hence the relevance of parental expectation as part of the home front variables measured in this research. The measurement of achievement motivation is relevant in many areas such as pre-assessing of abilities, monitoring learning process, diagnosing learning difficulties, supplying information to parents and selection of students for purposes like quiz, debate, sport, promotion, class type placement and awards, among others.

It has been the desire of both past and present Nigerian leaders to achieve sustainable development in the educational sector and policies are being continuously developed for implementation in this area. Many policies and programmes such as the National Policy on Education (NPE), emphasize the importance of Science, Technology, Engineering, and Mathematics Education (STEM) to the national development (Fafunwa, 2004). The 60:40 admission policies in which 60% of admission is in favour of Science and Information Technology (Effiom, 2008), the Vision 20-20 of the Millennium Development Goals (MDGs), the Seven Point Agenda of the late President Musa Yar'Adua, and Education for All (EFA) were all borne out of the same concern (Danmole, 2011).

# STATEMENT OF THE PROBLEM

Mass failure in Mathematics in Nigerian schools in the past thirteen years as seen in Table 1has been a source of concern to both government and stakeholders in the educational sector nationwide (WAEC, 2006). This research focuses attention on the experiences of students in Mathematics as a result of serious challenges it generates to research in this part of the world. As a way of suggesting a possible solution to this national problem which, particularly, is challenging the proficiency of Mathematics teachers in the educational sector, this research is intended to investigate the assertion that virtually all Nigerian students do not know that it takes goal-setting to succeed, and that it takes motivation to achieve every set goal.

Table .	1: Pe	rcentag	ge of ran	ure in M	latnema	lics 2000	- 2012 a	Cross Mi	geria					
Year		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	201	2012
													1	
<u>%</u>	of	63.9	65.94	63.09	65.48	61.34	55.88	58.88	53.15	66.91	74.0	60.43	69.3	<u>61.</u> 19
failure		4									1			
Source	: WA	EC Rep	ort 2012											

# Table 1: Percentage of Failure in Mathematics 2000 - 2012 across Nigeria

In spite of the obvious importance of the measuring instrument of achievement motivation that is both diagnostic and prognostic for successful performance, the use of such measurement tools appear not to be inexistence in schools in Nigeria hence the need to construct and validate an instrument that can measure the achievement motivation of Senior Secondary Students especially in Mathematics. The construction and validation of the instrument could assist in exploring some of the major reasons behind mass failure in Mathematics which in return could assist in proffering a lasting solution to the problem through the early use of the measuring instrument.

# **Theoretical Framework**

The theoretical framework for this study is based on:

- 1. Achievement Motivation Theory (McClelland, 1955)- McClelland's theory of achievement motivation states that a person's tendency to approach a task (effort) is a function of the strength of the achievement need, the strength of the need to avoid failure, the person's subjective belief about the possibility of success or failure, and value of the incentives associated with either success or failure.
- 2. **Theory of Motivation (Maslow, 1943)-** Maslow (1943) stated that people are motivated to achieve certain needs. When one need is fulfilled a person seeks to fulfil the next one, and so on
- 3. Social Cognitive Theory (Bandura, 1997) The Social–cognitive theory of Albert Bandura (2001), states that behaviour, environment, and person/cognitive factors are important in understanding personality.
- 4. **Expectancy Value Theory (Fishbein, 1975)-** Expectancy Value theory states that a person's behavior is determined by how much a goal is valued, and by the degree that the person expects to succeed.
- 5. **Realistic Mathematics Education Theory (Freudenthal, 1991)-** Realistic Mathematics Education (RME) theory of Freudenthal states that Mathematics must be connected to reality and human activity



### **Rationale for the Choice of Theories:**

Theories representing major frameworks in achievement motivation have been developed over the decades. These theories also share a common social-cognitive heritage. Social-cognitive theories examine cognition and behaviour (e.g., attributions, expectancies, purposes, perceived needs, capacities, and vulnerabilities) that are contextually located and influenced. This does not imply that the place of achievement motivation instrument is explicit and central in each theory; however, when it comes to operationalizing the theories in achievement motivation research, there is often a clear relevance for the importance of Mathematics which cannot be over-emphasized and the environment in which the learner finds self. The drive that propels the student to achieve may central on the value placed on mathematics by the students and the expectation of success is inevitable.

### **Purpose of Study**

The purpose of this study is to specifically:

Construct and validate a Mathematics Achievement Motivation Scale using reliability and

validity processes.

Establish the concurrent validity of Mathematics Achievement Motivation Scale (MAMS) Investigate the possibility of Mathematics Achievement Motivation Scale (MAMS) predicting students' performance in Mathematics Achievement Test (MAT)

# **Research Hypotheses**

The following stated hypotheses were tested during the study:

There is no significant internal consistency in the scores of students in Mathematics Achievement Motivation Scale (MAMS) There is no significant coefficients of concurrent validity when Mathematics Achievement Motivation Scale (MAMS) is correlated with Mathematics Motivation Scale (MMS)

There is no significant predictive validity of the Mathematics Achievement Motivation Scale (MAMS) on Mathematics Achievement Test (MAT)

### The Pilot Study Stages

Generation of items occurred in two steps: First, the content of the questionnaire was derived from face-to-face, semistructured interviews performed by the researcher. The researcher considered the reports of the interview and having read about the characteristics of achievement motivated students was able to generate 84 items which was first given to the experts for content validity for necessary amendments prior the pilot testing. The pilot study took place at a senior secondary school in Ikorodu North Local Council, Lagos State which was not involved in the main study. Seventy five SS II respondents were randomly selected for this stage of pilot testing and the number comprised thirty three boys and forty two girls who were in the three class-types as defined in this study. To achieve as high a response rate as possible, the purpose of the questionnaire was explained in addition to the covering letter as opined by Dillman (2000) and item reduction and validation was done.

### **Research Design**

The research design used in this study was an instrumentation design and it is subsumed in descriptive survey design. According to Kerlinger (1986), "survey design is the study of large and small population (universe) by selecting and studying samples chosen from the population to discover the relative incidence, distribution and interrelations of sociological and psychological variables".

### Population of the study

The target population for this study comprised all Senior Secondary Two (SS II) students in public co- educational schools within the six Geo-Political zones of Nigeria.

### Sample and Sampling Technique

The sample for the main study comprised 1,219 SS II students drawn from all the six geo-political zones of Nigeria. Multistage sampling method was adopted for this study.



### Instrumentation

Three research instruments were used in this study for data collection:

The Mathematics Achievement Motivation Scale (MAMS) which was constructed by the researcher used a Likert-Scale response format.

The Mathematics Motivation Scale (MMS): was validated by Eric Zhi, Feng Liu and Chan Hung (1991). The scale was developed based on the theoretical framework of Social Cognitive Model of Motivation

The Mathematics Achievement Test (MAT) was constructed by the researcher who has been teaching Mathematics for over twenty years. The items were based on the first four domains of cognition; the content was done based on the table of specification and also through item analysis.

## Analysis of Data and Presentation of Results

Each of the research hypotheses was tested in the o.

The factor analysis that was performed on the 84-item questionnaire after the administration of the instrument during the pilot study was very helpful in selection of the 30 items after matrix component was rotated. Also, the 30 items which have the highest component matrix values were selected for administration in the main study.

The iterative process of item selection resulted in a selected version which comprised 30 items which were administered to the larger population. The thirty-factor structure accounted for 80.97% of the total variance. The overall scalability was satisfactory, as all items showed a good fit to the Achievement Motivation variable within each dimension. The item analysis of the Mathematics Achievement Test (MAT) was also conducted at this level and all the items were found to be good for use. The rotated component matrix, component, component scores coefficients, component score covariance matrix, component scores coefficient matrix were all done.

### Table 2: The Coefficients of Reliability of the Pilot Study

	Chronbach Alpha	Chronbach Alpha Based	No of items	Extracted	
		on Standardised items		items	_
MAMS	.79	.81	84	30	

### Table 3: The ANOVA of the Pilot Study

	Sum o	of Squares	df	Me	an Square	F	Sig	
Between Peopl	e	152.539		53	2.878			
Within People	Between Items	985.249		80	11.816		19.64	.000
	Residual	2549.591	2	4240	.601			
	Total	3494.840	4	320	.809			
	Total		3647.	378	4373		.834	
<u> </u>	2.22							

Grand Mean = 3.23

The eigenvalue of the 84 items of MAMS reveals that after the thirty-factors the eigenvalue of the others 54 items were almost the same, the Factor Matrix also indicates that all the items positively correlated between each variable and each factor, the Rotated Factor Matrix revealed the loadings after the rotation and the purpose of factor extraction is to determine the appropriate number of factors to be extracted. All these provide an adequate basis for proceeding to an empirical examination of adequacy of factor analysis on both overall basis and for each variable. Also, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .87 which was above the recommended value of .6 and Bartlett's test of Sphericity was significant ( $\chi^2$ (1219) = 5.807,p<0.05).



Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.866
Bartlett's Test of Sphericity Approx. Chi-Square	5.807E3
Df	435
Sig.	.000

## **Table 5: Model Summary**

	· · · · · · · · · · · · · · · · · · ·				
Model	R	$\mathbb{R}^2$	df1	Sig	
1	.899ª	.808	27	.000	
2	.898 <sup>b</sup>	.807	1	.460	
3	.896°	.804	1	.289	
4	.893 <sup>d</sup>	.798	1	.162	

The factor analysis enabled the study to structure the variables into its principal components. The factors' scores obtained from the Factor Analysis were used in fixing the regression model of the type

 $Y=(\beta_{i}, Xj, \epsilon)$  where i=0,1,2,3,4....n

j=1,2,3,4,....n

 $\beta_0$  is the intercept of the regression line

let Xj be the jth principal component derivable from the Factor Analysis, the model is

 $Y = \beta_{0 \, +} \, \beta_1 \, x_{1 \ \, +} \, \beta_2 \, x_{2 \, +} \, \beta_3 x_{3} \ \, \beta_4 \, x_{4 \, ....} \beta_n x_n + \varepsilon.$ 

The study used the backward selection techniques to obtain the best model and Model 1 was found to be the best model. (  $R^2=0.808$ )

Model 1 was found to be the best model. (R<sup>2</sup>=0.808) and it is significant as shown ANOVA

# **Testing of Hypotheses**

**Hypothesis 1:** There is no significant internal consistency in the scores of students in Mathematics Achievement Motivation Scale (MAMS).

Table 7:	Cable 7: Mean, Standard Deviation and Reliability of MAMS						
Mean	Standard Deviation	Variance	No of Items	Cronbach Alpha			
91.53	10.21	104.25	30	0.89			

**Table 7:** shows the result of the statistical test of the reliability of Mathematics Achievement MotivationScale (MAMS). It was found that the 30 items of the MAM scale has a Cronbach's alpha ReliabilityCoefficient of 0.89 which was an improvement on the pilot study where the first eighty-four item instrument had .79 at .05level of significance. This high coefficient value indicates that each dimension of MAMS has sufficient internal consistency.

# Hypothesis 2

There is no significant coefficient of concurrent validity when Mathematics Achievement Motivation Scale (MAMS) is correlated with Mathematics Motivation Scale (MMS)



TOJET: The Turkish Online Journal of Educational Technology - December 2017, Special Issue for ITEC 2017149 is the scores of the participants in Mathematics Achievement Motivation (MAMS) will not sufficiently yield high coefficient of concurrent validity.

Table 8: Correlation between MAMS and MMS						
Variables	Ν	Mean	SD	r cal	r <sub>c</sub>	
MAMS	1219	91.53	10.33	0.94	0.062	
MMS	1219	91.51	10.29			
* Sig	nificant, p< 0.05	5				

Table 8 shows MAMS mean(x) score of 91.53 which is higher than that of the MMS mean(x) score of 91.51. The result of the Pearson product moment correlation shows that the calculated r-value of 0.94 is greater than the critical r-value of 0.062 at .05 significance level. This led to the rejection of the null hypothesis and the alternative hypothesis was upheld. This means that scores of the participants in Mathematics Achievement Motivation (MAMS) significantly and sufficiently yielded high coefficient of concurrent validity with the scores in MMS. Also the MAMS which is the dependent variable while MMS, a validated instrument is the criterion correlate well at 0.94 implies that R<sup>2</sup>=.88, this also ascertain the higher validity of the MAMS.

Hypothesis 3: This was first computed before using SPSS to compute the means and standard deviations of both variables from the total scores. Hence, Pearson Product Moment Correlation (PPMC) method was used to determine whether a relationship existed between the two variables. The result of the analysis of the first part data is presented in Tables 9 and 10

Table 9: Relationship between MAMS and MAT Scores							
Variables	Mean		Std. Deviation	Ν	r-cal	rc	
MAMS Score		61.53	10.33		1219		
0.89 0.062							
MAT Score	58.46		12.21	1219			

#### MANG and MATC

\* Significant, p< 0.05

There is significant predictive validity of the MAMS on the MAT scores.

Table 10 Descriptive Statistics and Pearson Correlation Analysis						
		MAMS	MMS	MAT		
MAMS	1					
MMS		0.94**	1			
MAT		0.91**	0.89**	1		
**. Correlation is significant at the 0.05 level.						

Table 10 presents the result of the Pearson product moment correlation of the instruments which show that the r-calculated values of 0.94, 0.89, and 0.91 were obtained at 0.05 significance level; hence, the null hypothesis was rejected and the alternative hypothesis accepted. Also, it is observed that higher scores in achievement motivation would lead to increase of performance in Mathematics.

# SUMMARY OF FINDINGS

The study was carried out to purposely construct and validate a measuring instrument that can measure the achievement motivation of Nigerian secondary school students in Mathematics. The following are the highlights of the findings based on the research hypotheses.

The scores of the participants in the Mathematics Achievement Motivation scale (MAMS) yielded significant and high internal coefficients with Cronbach's Alpha 0.89 at 0.05 significant levels. DeVellis (1991) posited that: ... an alpha below 0.60 is unacceptable; 0.60-0.65 undesirable, 0.65-0.70 minimally acceptable; 0.70-0.80, 0.81-0.90 very good and if much above, 0.90 excellent,

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Iterwas discovered that having used six of the De Vellis (1991) guidelines among others, the instrument was found to be reliable and valid. The item discriminality which determines whether the students who have done well on particular items have also done well on the instrument as a whole was good as this was evidenced in this study. This MAMS measures measured the degree to which the test items are homogenous, that is, measuring the same things, talents or skill (Mathematics) as asserted by llogu, 2005

This is a generic term associated with a number of multivariate statistical methods that model sets of manifest or observed variables in terms of linear functions of latent unobserved variables (Mulak, 1982). In other words, in factor analysis, dependent variables are manifest or observed variables linearly dependent on a set of latent unobserved independent variables (Ilogu, 2005). A measuring instrument can be reliable without being valid, but it cannot be valid unless it is first reliable (Ary, Jacobs & Sorensen 2010). The concurrent validity of Mathematics Achievement Motivation scale (MAMS) and Mathematics Motivation Scale (MMS) was significant. The scores of the participants in the MAMS yielded significant high coefficients of concurrent validity when compared with MMS. The correlation coefficient between the two instruments was 0.94 at 0.5 significant levels.

Validity, which is the development of sound evidence to demonstrate the test interpretation (of scores about the concept or construct that this MAMS has measured) matched the proposed use (AERA, APA, NCME, 1999). Therefore, the focus of validity emphasized *evidence* and *use* of this instrument rather than types (Thorndike, 1997). Validity is the degree to which all evidences point to the intended interpretation of test scores for the proposed purpose. Thus, a focus is on the consequences of using the scores from an instrument (Hubley & Zumbo, 1996; Messick, 1980). This is a generic term associated with a number of multivariate statistical methods that model sets of manifest or observed variables in terms of linear functions of latent unobserved variables (Mulaik, 1987).

The degree of correlation between the scores of the students in both MAMS and MAT confirmed the predictive validity of the MAMS instrument which implies that an instrument measuring the trait "achievement motivation" has shown to predict that high scorers work more independently, persist longer on problem-solving tasks, and do better in competitive situations than low scorers. This is corroborated the assertion made by Weiner in1992 when he said that the achievement motivated students want and expect to succeed; when they fail, they redouble their efforts until they succeed and not surprisingly, students who are high in achievement motivation tend to succeed at school tasks (Stipek, 1993). Attitude of students towards correction confirmed Fodor and Carver, 2000 that achievement motivated people to handle negative feedback about task performance more effectively than others. Bank and Finlapson (1980) found that successful students were found to have significantly higher motivation for achievement than the unsuccessful students. Johnson (1996); Broussard and Garrison (2004); Skaalvik and Skaalvik (2006) and Sandra (2002)in their respective studies discovered significant relationship between achievement performance and motivation.

With respect to motivation, a behavioural theorist might focus on the degree to which students learn to do schoolwork to obtain desired outcomes (Bandura, 1986; Weielkiewicz, 1995 of: Sprintall 2006). Kushman, Sieber and Harold (2000) opine that high motivation and engagement in learning have consistently been linked to reduced dropout rates and increased levels of students' success. Also high achieving individuals monitor their own learning and systematically evaluate their progress towards their goals more than low-achieving individuals do (Zimmerman & Schunk, 2001). In 2007, Ilogu also asserted that teachers should emphasize achievement motivation for students in any learning situation because he discovered that students with high achievement motivation perform better than those that are not really motivated to achieve.

The strong relationship between expectations and academic achievement has been well established both theoretically and empirically (Johnson, Livingston, Schwartz, and Slate, 2000; Marzano, 2003). Summarily, an instrument measuring the trait "achievement motivation" has shown to predict that high scorers work more independently, persist longer on problem-solving tasks, and do better in competitive situations than low scorers.



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In consideration of the summary, discussions and the implications of the findings and the following conclusions can be drawn: The Mathematics Achievement Motivation Scale (MAMS) is reliable

The concurrent and predictive validity of Mathematics Achievement Motivation Scale (MAMS) was established

The main purpose of the study which was to construct and validate an assessment instrument to enhance achievement scores in Mathematics so as to contribute to the effort being made through the Nigeria Policy on Education in order to attain the national goal has been achieved. The need for assessment instrument seems global as Robert A. Garden in his "Development of TIMSS Performance Assessment Tasks" asserted the need to focus on educational policies, practices, and outcomes in order to enhance mathematics and science learning within and across systems of education by Beaton, Mullis, Martin, Gonzalez, Kelly, & Smith, 1996 and this also corroborated by this study.

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# Critical Reflection as Catalyst to Unlock the Power of Experiential Learning

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# ABSTRACT

Experiential learning is widely accepted as a teaching methodology which aids the transfer of learning. It is however also a fact that the transfer of learning remains elusive. The aim of the research study was to explore the nature and extent of reflective practices by students on a Coaching Master's programme at a South African University. The specific focus was to determine the perceived value of these reflective practices on the learning journey of the student. The data sources were semi-structured interviews as well as the summative reflective essays of students who formed part of the programme. A phenomenological interpretive approach was used to analyse the data and to extract the meaning of students as it pertains to the stated research objectives. When asked to report on the perceived value of reflection, students reported numerous programme related areas which subsume both emotional and practical skill aspects. It was found that reflection heightened the conscious awareness related to a wide variety of students' coaching experiences, thereby enabling students to contemplate new coaching behaviours. The reported behaviour changes covered a wide array of coaching related aspects which range from improved pre-coaching activities, improved coaching practice as well as improvements in coaching results for clients. These findings highlight the transformational influence of reflective practice when it is embedded in an experiential learning programme. The lessons learnt from this study done at tertiary level is of particular importance to the teaching fraternity because it can, if implemented as part of the schooling system or teacher training, become a key tool for transformative learning.

# INTRODUCTION

Transfer of learning at higher education institutions could improve significantly if the structure of experiential learning programmes as it relates to reflective practice, is foregrounded. Evidence to suggest that the challenge of the effective transfer of vast amounts of information can be improved, could potentially influence both learning as well as teaching practices and it may also influence the way educational programmes are structured. It could further have far-reaching implications for the learning experience of students as well as for the labour market which receives the students after completion of their studies.

The challenge that institutions of higher learning face relating to the transfer of huge amount of programme related learning, is made explicit by empirical evidence which suggests that transfer of learning is not ordinarily achieved (Baldwin & Ford, 1988) and furthermore illuminated by the fact that this learning transfer deteriorates over time (Wexley & Latham, 2002). This decay of learning over time is random and it cannot be predicted precisely what data will be lost but some loss will inevitably occur (Hastings & Pekelney, 1982). It seems evident therefore that there are distinctive demands on experiential learning programmes to succeed in its quest to transfer learning effectively.

This article focuses on the perceived value of reflective practice on the learning journey of the M Phil Management Coaching student at the Business School of the University of Stellenbosch in the Republic of South Africa. The research further set out to determine how reflective practices, as an important component of the programme structure, contributed to the translation of learnt concepts into context-relevant behaviour changes for M Phil students. Boaden (2006) affirms that the learning programme structure indeed makes a difference, for not only programme participants but also their organisations and the clients that they serve.



The findings of this study strengthened the M Phil programme foundation because it confirmed the elements of reflective practices that support the transfer of learning and it reported on possible improvements where these practices were found to be less than optimal. This research will also be usefull to academic staff who are developing experiential higher education learning programmes nationally and internationally.

The M Phil Management Coaching programme at the University of Stellenbosch aims to impart both a broad range of theoretical underpinnings of coaching as well as the practical skill to conduct coaching. The main adult-learning approach is experiential learning, which is supplemented by work-based learning and evidence-based practice. Reflective practice is integrated into all aspects of the programme by way of providing students with suggested areas to reflect on and this is done in the form of a reflective journal. The suggested areas for student reflection covers the different programme areas which subsume, *inter alia*, reflection on the student's own personal learning style, reflection on the development of the student's personal coaching framework, reflection on learning days, supervision-groups and skill practices with the key focus being "how these inform the student's development as coach". Students are prepared for reflective practice by teaching and also through formative assessment feedback on assignments and face-to-face feedback during group-supervision-sessions.

Rouiller and Goldstein (1993) states that since the introduction of Kirkpatrick's four levels of evaluation, the evaluation of the transfer of learning has included examination of the characteristics of learning programmes. It was therefore sensible to assess the perceived contribution of reflective practice in the quest to determine its perceived contribution to the transfer of learning on this programme.

# **CONCEPTUAL FRAMEWORK**

# Experiential learning as relevant learning theory

Experiential learning theory was chosen as the relevant theory and the experiential learning theory of Kolb was chosen as the specific theory for this research project. The description of the programme structure above, indicated that experiential learning theory forms the foundation of the M Phil Management Coaching programme. The distinctive feature of experiential learning according to Andresen, Boud and Cohen (1995), is that the experience of the learner occupies the central place in teaching and learning. They further argue that the ultimate aim of experiential learning includes the learners' own assumption of something that is personally significant to them. While it is acknowledged that the views of experiential learning differs, the definition of McGill and Warner Weil (1989) offers the following widely accepted explanation:

"The process whereby people individually and in association with others, engage in direct encounter and then purposefully reflect upon, validate, transform, give personal meaning to and seek to integrate their different ways of knowing. Experiential learning therefore enables the discovery of possibilities that may not be evident from direct experience alone".

# **Experiential learning cycle of Kolb**

The experiential learning theory of Kolb (1984) is applicable, not only because it forms an important part of the M Phil Management Coaching programme but also because Kolb is regarded as one of the spiritual Fathers of reflection (Streumer & Kho, 2006). The experiential learning model of Kolb is described as a very useful model for coaching because all clients show up for coaching with their own concrete experiences. The coach and the client then engage in observation and reflection, thinking and theorising based on the client's observation, resulting in a decision regarding what new thinking, feeling and behaviour would be appropriate in the specific situation under discussion (Stout Rostron, 2012).

Kolb's experiential learning model is presented below (Figure 1) as a four-stage model in which action is the basis for reflection. The reflections are assimilated into findings, from which application of new behaviours can be inferred. Each of the four stages are equally important in contributing to the learning process. According to Kolb (1973) the student needs to display four different kinds of abilities to be effective in the experiential learning process.



These abilities subsume the ability of the student to involve him/herself fully, openly and without bias in new experiences (action), the ability to reflect and observe these experiences from many different perspectives (reflection), the ability of the learner to create concepts that integrate these observations into theories which are logically sound (findings) as well as the ability to use these theories for decision making and problem solving (application).

Figure 1 below, depicts the four stages in Kolb's experiential learning model and illustrates the location of reflection in the experiential learning cycle.

# Figure 1: The experiential learning cycle of Kolb

Source: Adapted from Kolb, 1984

Given the fact that this study focuses on the perceived value of reflection, it is evident that the concept of reflective practice and its theoretical aspects should be clarified.

### **Reflective practice**

According to Hickson (2011), the concept of reflection has been around since ancient times and there is renewed interest in reflective practice as a way of understanding and learning from experiences. Reflective learning is defined as the process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self, and which results in a changed conceptual perspective (Boyd & Fales, 1983).

There is a need to distinguish between important theoretical aspects of reflection, which emerges from the further exploration of its definition. Bourner (2003) differentiates between reflective learning, which is subjective and the process of reflection, which is not. He argues that the core of the reflective learning process is interrogating what happened with searching questions, which can be identified separately from the content of the reflection. Reflective learning is therefore not what happens to a student but what the student does with what has happened. The assessment of reflection should therefore not only focus on the content of reflection but on the actions of the student based on the experience. This separation corresponds with the experiential learning theory of Kolb that separates action from reflection. It is therefore important to discuss a structure for the assessment of reflection.

# Assessment of reflective practice

While there is a renewed interest in reflective practice during experiential learning, there is a need to map reflective statements against reflection models in order to aid the assessment and analysis of reflective endeavours (McKinney & Sen, 2012). The challenge which remains pertinent however is that the method for collecting and assessing student reflections is difficult (Dalal, Hakel, Sliter & Kirkendall, 2012) and therefore accurately linking depth and its consequences remain illusive. The reflective work of students should firstly be classified into unreflective thinking which comprises of bringing thoughts into conscious awareness and critical thinking which requires asking questions and responding to these searching questions (Bourner, 2003).

### The selected model to code reflective writing of students

The model proposed by Kember, Jones, Loke, Mckay, Sinclair, Tse, Webb, Wong, Wong and Yeung (1999) assumes that if a curriculum is designed to encourage reflective thinking, there is a need to determine whether students reflect as well as the depth of their reflective thinking. In their quest to find a suitable model, Kember *et al.* (1999) came to the conclusion that there does not appear to be any widely accepted procedure for determining whether reflective practice takes place or for assessing the level of reflective thinking from written reflective journals. The thrust for the development of their own model was that it should focus upon reflective thinking, as it appears in students' reflective journals, and that it should assess reflection directly. The coding scheme developed by Kember *et al.* (1999) is based on the work of Mezirow (1991). This model is depicted in Figure 2 below and it sub-divides reflective thinking into non-reflective action, which comprises the shaded lower levels while the upper levels are regarded as reflective. Categories on the same horizontal level are regarded as of equivalent value at the level of reflective thinking.



	7. Reflecting on unde		
4. Reflecting on content	5. Reflecting on process		6. Reflecting on process and content
2. Contemplation		3. Cons	idered action
	1. Routine action		

## Figure 2: Coding categories for reflective thinking

Source: Kember, Jones, Loke, Mckay, Sinclair, Tse, Webb, Wong, Wong and Yeung (1999)

Three types of non-reflective action are distinguished, namely habitual action, thoughtful action and introspection. Habitual action is action that is performed with little conscious thought such as driving a motor vehicle. Action that makes use of existing knowledge without assessing that knowledge results in learning which remains within pre-existing perspectives which is classified as thoughtful action. Introspection lies in the affective domain and refers to feelings or thoughts about ourselves. Although it can encompass the identification of feelings towards others such as being attracted to others, it does not entail us deciding how or why these feelings developed and therefore it remains at the level of recognition of the feelings (Kember *et al.*, 1999).

While content- and process reflection is being interpreted as being equivalent in level, these two types of reflection are distinguishable in terms of the subject matter of the reflection. Content reflection deals with "what" while process reflection deals with "how". The definitions by Mezirow provide a clear distinction between the two concepts. Content reflection is defined as reflection on what we perceive, think, feel or act upon while process reflection examine how one performs the functions of perceiving, thinking, feeling or acting as well as assess the efficiency in their performance (Mezirow, 1991). Content reflection may therefore refer to the features, which are noticed when encountering a new concept, while process reflection may entail asking the question: "What procedure am I following when performing a certain skill?" The model in Figure 3 above also makes provision for a combination of these two modes of reflective thinking on the same horizontal level. If content reflection and process reflection is combined, it would therefore still be categorised on the same level.

The highest level of reflective thinking in this model is named premise reflection. Mezirow (1991) states that premise reflection involves the individual becoming aware of why they perceive, think, feel or act the way they do. The underlying, often unconscious, set of beliefs and values that were assimilated also have to be identified and critically reviewed. Mezirow (1997) states that our frames of reference are the structures of assumptions through which we understand our experiences. Mezirow (1991) points out that perspective transformation is difficult as it involves an interruption during which a problem becomes redefined so that action may be redirected. Premise reflection is therefore seen as a higher level of reflection because it transforms the student's meaning framework, which includes beliefs and assumptions, by opening the possibility of perspective transformation.

# RESEARCH AIM, OBJECTIVES, METHODOLOGY AND DATA COLLECTION

This study aimed to answer the research question: "What is the perceived contribution of reflective practices to the learning journey of the student on the M Phil programme?" The research objectives, which guided the research, included:

- To determine the depth of students' reflections;
- To determine the perceived value which students derived from reflective practices

The study followed a phenomenological, interpretive approach. Seamark and Lings (2004) indicate that interpretive phenomenological analysis concerns itself with the subject's experience of the topic being researched and therefore does not attempt to produce an objective statement. It rather tries to disentangle the meaning from people's stories through interpretive engagement with data collected through interviews and transcripts.



The phenomenological position required that social science should take into consideration that people are constantly updating and changing their interpretation of the world (Babbie & Mouton, 2011). This aspect was particularly relevant due to the focus of the research on the learning journey of the student over a period of one year. The summative reflective essays of students covered their learning journeys during the programme and allowed them to record their learning journeys as these unfolded.

A purposive sample of six students were drawn from the group of twenty-four students who started their M Phil programme and these students were interviewed with a semi-structured interview. The interviews were recorded and transcribed. The summative reflective essays of the sampled students were also analysed as supplemental evidence to attain the research objectives. The fact that two data collection methods were used, enabled triangulation, which strengthened the study. Consent was obtained from each student before the data gathering process commenced. Confidentiality was ensured by not revealing any information about a specific student in the study but by only reporting on themes that emerged from the data. The research data was also stored securely and only the researcher had access to it.

The data analysis commenced after the data collection process was completed. The data analysis comprised coding of the data according to themes. The coding process was assisted by the elements of reflective practice identified as part of the relevant theories that were described in the conceptual framework above. The data was transformed and reduced through an inductive approach. A relevant qualitative software package, namely Atlas.ti was utilised for the initial stages of the data analysis process. The *Atlas.ti* software package supports qualitative data analysis by electronically enabling different levels of coding and displays this information per coding level. Further detailed qualitative data analysis was completed manually. The research findings were based on the evidence in the qualitative data and recommendations were based on the findings.

# FINDINGS AND DISCUSSION

The findings below are based on the analysis of gathered data. Emerging themes and relevant quotes from the gathered data are presented per research objective. The findings and discussion is presented below the qualitative data samples per theme. The reference "*Int*" before every data quotation refers to interviewee while the reference "*RE*" before each data quotation refers to a reflective essay. Both interviewees and reflective essays of students were data sources for the study.

# Findings related to research objective 1: To determine the depth of students' reflections.

Theme1: Rigour in reflections

# The following are examples of the responses:

Int 1: "I used the ICF competencies and feedback provided by peers and academics after assignments, to add rigour to my reflections."

Int 3: "I embraced feedback from supervision because it gave me a chance to reflect better. The other thing that I embraced, was that I had something called OCS (observed coaching sessions). I paid a coach to watch me coach and then give me feedback. I also asked my clients to give me feedback after each session, which they gave me in writing. So for me there was so much that come out of that, so I used a lot of that learning in my reflection."

The observations confirmed that there were various sources of feedback which students gathered at different times during the programme. This feedback from lecturers, peers and coaching supervisors added rigour to students' reflections. Rigour in reflection enables evidence based, deep reflection that supports the



transformation in students' behaviours. These behaviour changes are essential for the formative journey of the coaching student. This finding indicates that the common challenge during reflection, namely that students' reflections are based on their own unverified opinions, with the result that they have no new knowledge on which to base an attempt to reconstruct ideas or practice (Ryan, 2013), have been circumvented.

## Theme 2: Focus of reflections

The following are examples of the responses:

*RE 1: "… I personally feel I did not do too well as a coach. The model that I had did not suit her personality. Instead of applying the Time to Think-methodology, personal construct methodology would have worked better. Issues that came to the surface were how … handled the situation, the loss of esteem regarding the job, and the positive spinoff of having more time in the new job to focus on other activities."* 

RE 2: "The second day of supervision took place on 16 June. The seven-eyed model of Hawkins was used to facilitate the process by group members each asking a question based on the case you presented. This assisted to focus you on the issue you grappled with and effectively reach a solution in this regard. I presented a case where I coached ... and I felt the lines between coaching and managing became blurred. The group helped me to establish that in this instance, I should have just acted as the manager and referred him to someone else for coaching assistance. It helped me realize that as a coach you should not coach your own staff, as you will naturally tend to take on a managing role. I have subsequently referred him and another staff member in my own team to someone else."

Evidence was found of both content and process reflection. Kember et al. (1999), define critically reflecting students as those demonstrating insight through analysis and an evaluation of the situation. The reflections of students contained critical analysis of their own behaviour and therefore met the specified criteria. This confirms that students have moved beyond non-critical reflection into the space of critical reflection. This provides the basis for the highest level of critical reflective practice, namely premise reflection, during which a change in the underlying belief, value or assumption is consciously made. Another insight gained was that students were adequately prepared and supported to implement reflection on the programme.

# Theme 3: Evidence of premise reflections

Two of the six sampled students provided evidence of premise reflection. The quote below is an example of a premise reflection.

RE 4: "I have learnt that I did not have to be responsible for the health, safety and well-being of others. I am able to see more clearly how coming from being a rescuer was not serving anyone – not my clients, and definitely not myself. … The shift for me is that I have been able to step back and give myself more space to actually play out my own life. But more profoundly is the fact that I have been able to step back and give my clients more space to do the same with their own lives. I am able to hold them gently but also in a way that supports them in being more accountable for their own learning and development. I understand that my clients need to move through all the phases of learning in order to truly grow into an enlightened version of themselves and extended way of being. … What I am more conscious of is that I am able to release things that do not belong to me. I am getting better at letting-go and by implication I am therefore taking on much less. I am able to be more present and complete in my own life, making me more available and able to provide more supportive coaching conversations. In stepping back from: 'I need to help people to protect them from harm and save them from pain' I am actually able to empower them more and in the process help myself to grow too."

Kember *et al.* (1999), mentions that for writing to be coded as premise reflection, there needs to be evidence of a significant change of perspective and it is unlikely that it would occur frequently in the journals of students. The fact that only two of the six students provided evidence of premise reflection, support this notion. Mezirow (1991) explains that conventional wisdom and deep-seated assumptions are hard to change partly because they become so deeply embedded that we become unaware that these are assumptions or even that these assumptions exist. It seems premise reflection does occur with a lower frequency than content and process reflection. It is also evident that premise reflection requires the student to 'dig deep' in order to uncover the underlying beliefs, values and assumptions. The transformational nature of premise reflection becomes clear because of the disruption in the existing behaviour pattern.

# Findings related to research objective 2: Perceived value of the reflection

Theme 1: Value of reflection as it relates to heightened awareness

Students reported a wide variety of benefits of reflection in terms of heightened awareness as evident from the following quotes:

Int 5: "In class people became emotional. At work people also become emotional. I would go out, give them ten minutes and then resume the conversation. Nancy Kline said that if a person becomes emotional it is time for a breakthrough in terms of your thinking. I had to go through that. Why do I get the urge to run away when people become emotional? I wanted people to be rational and clinical and did not understand why they became emotional. Reflection assisted me to change, to grow. I became aware of my own emotions and my own thinking."

Int 5: "I became aware that me being in a hurry had an effect on my client. I could see how my questioning them and trying to hurry them along was affecting them. I realised that this was not a recipe to get from one point to another. This was the beauty of it. My clients said they looked forward to the sessions. Sometimes it takes four or five sessions for clients to open up. I mastered attentive listening and the pace."

RE 1: "With the time limit of twenty five minutes per session given, one makes the mistake to setting a goal in order to start with the session, so that there could be an outcome. This leads to no purpose to the discussion and talking around in circles. Time pressure and being results orientated cause one to want to rush in and start the coaching session. Goal clarification needs to be done, and it is possible that the initial goal stated by the client is only a symptom of an underlying core challenge. Goal clarification is very important. I will rather take longer to clarify the goal, than to dive into unpacking the situation."

RE 6: "I did realise that for a client to 'expose' himself to a coach, there needs to be trust and trust building starts off with contracting, knowledge of each other, ethics adhered to, professionalism in the intervention and a few other factors."

The areas where students gained a deeper level of awareness were, among others:

- Insights into own values, beliefs and assumptions.
- The effect of a less than optimal state of mind during coaching on students.
- The effect that clients' emotions had on their coaching.
- How their pace as coaches affected the client.
- The importance of clear goal setting defined at the onset of a coaching session and the consequences if this was not done.
  - Understanding and implementing professional coaching boundaries.
- The lack of foundational knowledge which was subsequently translated into a personal development area.



From the summary of the distilled learnings of students above, it is concluded that reflection created an in-depth awareness of what happened during coaching conversations. The fact that reflection revealed additional information regarding coaching practice, categorises it as a valuable observation tool which brings aspects of coaching practice into awareness which might have gone unnoticed. This is also indicative of the fact that the student is actively engaging in the second step of the experiential learning cycle of Kolb (1984), namely reflection, because the reflections are focused and it produces a tangible output. The fact that these developmental aspects were observed provides a vital link in the experiential learning cycle, which, if it was not observed would leave a substantial void in the development of the student coach.

Theme 2: *Value of reflection as it relates to resulting behaviour changes* 

Some of the quotations from students are provided below:

RE 4: "I have become more learner-centred and have embraced the opportunity to allow the client to take centre stage."

RE 4: "I have found that since my concerted effort to slow down, and to manage pace and time differently, I feel that I am getting more done - in the same time period. How I listen and the quality of attention I give my clients is something that I am working hard to improve. I find that when I manage silences better I definitely create space for both of us to think."

RE 5: "I now respect people and their spaces more. There are many roads to Rome and your route determines how you get there. It is of no consequence if you reach it in the same amount of time as me. If you want to change your destination I have to respect it as what you need at the time."

This section provided evidence of transformed behaviour as a result of reflective practice over a wide range coaching components, such as more focused contracting, student coaches who clearly states their own values clear at the onset of coaching, making time to become quiet and focusing their attention on the client before coaching, focusing more on the pace of the client and creating more time to think during coaching sessions. The abovementioned results become all the more extraordinary when it is considered that doing reflection and implementing the intended actions are not automatically forthcoming (Boud, Keogh & Walker, 1998; McAlpine *et al.*, 1999). These new behaviours came about as a result of the students' active participation in the experiential learning process, of which reflection formed and integral part.

Alignment between underlying beliefs and values, people's actions and their words seem to hold the key to lasting behavioural change. Bradt and Vonnegut (2009) states that for behaviour change to be sustainable, people's being (their core values, assumptions, beliefs, and intentions), their actions and their words need to correspond. When people's words and actions match but are not aligned with underlying assumptions and beliefs, those people's words and actions will change over time.

Student coaches could therefore be able to predict the extent to which their behaviour change is sustainable by reflecting on the alignment between their actions and words on the one hand and their underlying beliefs and assumptions on the other. This technique is therefore an invaluable diagnostic tool for students' own professional development and also has value to assess whether behaviour change in coaching clients is likely to be sustainable.

# CONCLUSION

This study presented an overview of how reflective practice was integrated into all aspects of the learning programme structure at tertiary level and how students were prepared to effectively implement reflection. The research finding suggested that students were adequately prepared to reflect and that students exhibited rigour in their reflections. A probe of the depth of students' reflective practices revealed that these reflections did indeed satisfy the criteria for critical reflection and that, in a minority of cases it contained evidence of premise reflection. It emanated that students however needed more support to engage in premise reflection.



The enquiry into the reported value of reflection revealed increased awareness of a wide array of situational aspects and processes occurring within the individual mind or the self such as beliefs. It was concluded that reflection brought these aspects into conscious awareness, thereby enabling a more objective basis for reflections. The reported behaviour changes in coaching students covered a broad range of coaching areas from improved contracting, more focus during coaching sessions to positive behaviour changes in their clients as a result of their own changed behaviour. These behaviour changes came about as a result of the student moving beyond reflection to application, thereby purposefully completing the experiential cycle.

The reported behaviour changes also extended to coaching clients which evidences the attainment of the ultimate goal of coaching, namely the enhancement of performance and well-being of coaching clients. It also serves as confirmation that the transfer of learning occurred. There is however recognition of other intervening variables, apart from reflection, which might have contributed to the reported behaviour changes in both the coaching students as well as coaching clients.

One further fact which emerged is that the reflective essays of students which thematically summarised their reflections contained evidence of the transfer of learning. The normal arduous, lengthy and costly process of data collection to establish learning impact assessment is therefore eliminated, because the data is generated as part of the assessment requirements of the programme.

The prominent finding of this study is that critical reflection, if purposefully implemented into a learning programme, serves as the catalyst which unlocks the power of experiential learning. Critical reflection is therefore a skill that teachers and learners should acquire and develop to fully harness the power of the experiential learning process. Further research on a criterion-based assessment framework to guide the development and assessment of critical reflection skills will assist its practical implementation as part of experiential learning programmes.



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# Determination of the Frequency of Athletic Triad in Women Athletes in Olympic Branches and the Awareness Levels of Athletes and Trainers Regarding Athletic Triad

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# ABSTRACT

The aim of this study is to determine the awareness levels of the national level athletes and coaches regarding Female Athletic Triad and whether our athletes carry the symptoms of Female Athletic Triad. The research was conducted in the time period between May-December 2015 with the voluntary participation of 115 national level athletes competing in various sports branches. 3 of the participants competed in Artistic Gymnastics, while 5 competed in Marathons, 9 in Badminton, 25 were Licensed Badminton League Sportsmen, 9 competed in Basketball, 6 competed in Arm Wrestling, 12 in Ice Hockey, 5 in Curling, 11 in Soccer, 4 in Weightlifting, 7 in Taekwondo Competition, 5 in Taekwondo-Poomsae, 7 in Volleyball and 7 competed in Swimming. Female Athletic Triad Questionnaire which passed the general validity assessment and was created by Heidi Wengreen of Utah University was used as part of the data collection process. As a result of this study; majority of the athletes stated that they "have not heard of the Women's Athletic Triad before". Regarding the question related to the intake of calories, athletes, weightlifters and swimmers answered that they were not able to take. Regarding the question related to the stress fractures, Athletics, Badminton and Weighlifting branches answered yes. Again when the first menarch age of many badminton players was questioned, League badminton players and Basketball players were determined to be in the 14-15 age group, along with Athletics and National Badminton Players in the 15-16 age group. To a question regarding the menstrual regularity, athletes in the sport branches Badminton, Basketball, Arm Wrestling, Ice Hockey and Taekwondo Poomsae answered that their menstruations were very irregular throughout the year. In the light of all these results, it can be suggested that the athletes under risk may be informed about Female Athletic Triad via seminars prepared through the support of the Ministry of Youth and Sports, the Sports Education Department and the sports federations domain experts and afterwards these seminars can be extended to every sports branch.

Female Athletic Triad, Female Athletes, National Team (A Level)

# INTRODUCTION

Participation in sports activities allows friendships to be built among teammates while boosting self-esteem and pushing the women to have healthier lifestyles. In the light of the information on the field, it is also safe to say that women can develop particular medical conditions including the Female Athlete Triad (Troy et al., 2006). The Female Athlete Triad consists of three elements that are 1-Disordered eating 2-Amenorrhea 3- Osteoporosis and osteopenia. In 1997, The American College of Sports Medicine (ACSM) published a position stand in which they stated that more epidemiological and clinical data was needed in order to support the importance of the Female Athlete Triad (Dipietro & Stachenfeld, 2006).



The three corners of the Women's Athlete Triads are related to the psychological and physiological mechanisms. In order to achieve an optimal standard, psychological pressure and a requirement to maintain a low body mass usually result in intense training. This is combined with low-energy intake and stress hormones produced psychologically by the endocrinologic control of menstrual cycle, and causing the athletes to become amenorrhea (menstruation or abnormal cuts in menstruation). Amenorrhea caused by dysfunction of the hypothalamus and pituitary gland causes a decrease in estrogen production. This hormone is a means to maintain adequate bone mineral density (BMD). This is why low estrogen levels are associated (Birch, 2005).

The three corners of the Female Athlete Triad are connected through psychological and physiologic mechanisms. In order to achieve an excellent standard –and usually to maintain a low body mass- the athletes train extensively. When the extensive training comes together with low energy intake and the stress hormones produced by psychological changes in the endocrinologic control of the menstrual cycle, the athletes may become amenorrheic, which can be explained with the absent or abnormal cessation of menses. When the dysfunction of the hypothalamus and pituitary gland causes amenorrhea, the production of estrogen decreases. Estrogen is fundamental for maintaining decent bone mineral density (BMD). Therefore, low estrogen levels are associated (Birch, 2005).

All female athletes may potentially develop the triad, however, athletes who compete in sports in which low body weight is considered to be essential may bear an increased risk of the triad. This data is contradicted by a position statement which states that this syndrome occurs not only in experienced athletes, but also in non-athletes and in other women who are active but are not training for any particular sport. However, it is unclear to which degree the girls and women practicing physical activity at different levels are at risk of the triad (Torstveit & Borgen, 2004).

### METHOD

The research consists of the athletes competing in A level national teams and the A level national team trainers who coach them. 3 of the 115 voluntary participants competed in Artistic Gymnastics, while 5 competed in Athletics Marathons, 9 in National Badminton, 25 were Licensed Badminton League Sportsmen, 9 competed in Basketball, 6 competed in Arm Wrestling, 12 in Ice Hockey, 5 in Curling, 11 in Soccer, 4 in Weightlifting, 7 in Taekwondo Competition, 5 in Taekwondo-Poomsae, 7 in Volleyball and 7 competed in Swimming. Regarding the questionnaire applied to the trainers however, 3 of the 16 participating trainers coached in Artistic Gymnastics while 1 coached in Athletics, 1 in Badminton, 2 in Basketball, 1 in Arm Wrestling, 1 in Ice Hockey, 1 in Curling, 1 in Soccer, 1 in Weightlifting, 1 in Taekwondo, 2 in Volleyball and 1 in Swimming.

Initially, 6 socio-demographic questions prepared by Heidi Wengreen from the Utah State University were used as part of the data collection tool, which were then followed by 26 additional questions about the Female Athletic Triad, forming the 32-question Female Athletic Triad Questionnaire.

In the questionnaire applied to the trainers however, 20 questions were asked, which included 1 sociodemographic related question and 19 Female Athletic Triad related questions.

# FINDINGS

Table 1. Awareness Levels of FAT

	Branches	Yes	No
	Art. Gymnastics	%0	%100 (3 people)
	Atl. Marathon	%60 (3 people)	%40 (2 people)
	Badminton L	%8 (2 people)	%91 (22 people)
	Badminton M	%11 (1 people)	%88 (8 people)
Have you	Basketball	%44 (4 people)	%55 (5 people)
ever heard of	Arm Wrestling	%0	%100 (6 people)
Female	Ice Hockey	%0	%100 (13 people)
Athletic Triad?	Curling	%0	%100 (5 people)
	Soccer	%0	%100 (11 people)
	Weightlifting	%50 (2 people)	%50 (2 people)
	Taekwondo	%14 (1 people)	%85 (6 people)
	Taekwondo P	%40 (2 people)	%60 (3 people)
	Volleyball	%71 (2 people)	%28 (5 people)
	Swimming	%0	%100 (7 people)


When the frequency chart is examined, it can be seen that 100% of the athletes in the Artistic Gymnastics branch have never heard of the Female Athletic Triad before.

When the frequency chart is examined, it can be seen that 60% of the Marathon runners in the Athletics branch have heard the term Female Athletic Triad before, however 40% of the athletes have never heard of it before.

When the frequency chart is examined, it can be seen that 8% of the League Badminton athletes have heard the term Female Athletic Triad before, however 91% of the athletes have never heard of it before.

When the frequency chart is examined, it can be seen that 11% of the M. Badminton athletes have heard the term Female Athletic Triad before, however 88% of the athletes have never heard of it before.

When the frequency chart is examined, it can be seen that 44% of the Basketball athletes have heard the term Female Athletic Triad before, however 55% of the athletes have never heard of it before.

When the frequency chart is examined, it can be seen that 100% of the athletes in the Artistic Arm Wrestling branch have never heard of the Female Athletic Triad before.

When the frequency chart is examined, it can be seen that 100% of the athletes in the Ice Hockey branch have never heard of the Female Athletic Triad before.

When the frequency chart is examined, it can be seen that 100% of the athletes in the Curling branch have never heard of the Female Athletic Triad before.

When the frequency chart is examined, it can be seen that 100% of the athletes in the Soccer branch have never heard of the Female Athletic Triad before.

When the frequency chart is examined, it can be seen that 50% of the Weightlifting athletes have heard the term Female Athletic Triad before, however 50% of the athletes have never heard of it before.

When the frequency chart is examined, it can be seen that 14% of the Taekwondo athletes have heard the term Female Athletic Triad before, however 85% of the athletes have never heard of it before.

When the frequency chart is examined, it can be seen that 40% of the Taekwondo-Poomsae athletes have heard the term Female Athletic Triad before, however 60% of the athletes have never heard of it before.

When the frequency chart is examined, it can be seen that 71% of the Volleyball athletes have heard the term Female Athletic Triad before, however 28% of the athletes have never heard of it before.

When the frequency chart is examined, it can be seen that 100% of the athletes in the Swimming branch have never heard of the Female Athletic Triad before.

Table 5. Regarding the Calorie Intake

	Branches	Yes	No
	Art. Gymnastics	%100	%0
	Atl. Marathon	%20 (2 people)	%80 (4 people)
	Badminton L	%75 (18 people)	%25 (6 people)
	Badminton M	%88 (8 people)	%11 (1 people)
Do you think	Basketball	%88 (8 people)	%11 (1 people)
you have	Arm Wrestling	%83 (5 people)	%16 (1 people)
sufficient	Ice Hockey	%84 (11 people)	%15 (2 people)
calorie	Curling	%100 (5 people)	%0
intake?	Soccer	%90 (10 people)	%9 (1 people)
	Weightlifting	%50 (2 people)	%50 (2 people)
	Taekwondo	%85 (6 people)	%14 (1 people)
	Taekwondo P	%100 (5 people)	%0
	Volleyball	%100 (7 people)	%0
	Swimming	%0	%100 (7 people)



When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 100% of the athletes in the Artistic Gymnastics branch answered yes, while 0% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 20% of the athletes in the Athletics branch answered yes, while 80% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 75% of the athletes in the League Badminton branch answered yes, while 25% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 88% of the athletes in the M. Badminton branch answered yes, while 11% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 88% of the athletes in the Basketball branch answered yes, while 11% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 83% of the athletes in the Arm Wrestling branch answered yes, while 16% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 84% of the athletes in the Ice Hockey branch answered yes, while 15% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 100% of the athletes in the Curling branch answered yes, while 0% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 90% of the athletes in the Soccer branch answered yes, while 9% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 50% of the athletes in the Weightlifting branch answered yes, while 50% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 84% of the athletes in the Taekwondo branch answered yes, while 15% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 100% of the athletes in the Taekwondo-Poomsae branch answered yes, while 0% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 100% of the athletes in the Volleyball branch answered yes, while 0% of the athletes answered no.

When the frequency chart is observed, it is seen that to the question "Do you think you have sufficient calorie intake?" 0% of the athletes in the Swimming branch answered yes, while 100% of the athletes answered no.

Table 6. Do Athletes Feel Pressure to Maintain Weight?

	Branches	Yes	No
	Art. Gymnastics	%33 (1 people)	%66 (2 people)
	Atl. Marathon	%80 (4 people)	%20 (1 people)
Do you feel	Badminton L	%41 (10 people)	%58 (14 people)
pressure to	Badminton M	%33 (3 people)	%66 (6 people)
maintain	Basketball	%33 (3 people)	%66 (6 people)
your weight?	Arm Wrestling	%66 (4 people)	%33 (2 people)
	Ice Hockey	%30 (4 people)	%69 (9 people)
	Curling	%20 (1 people)	%80 (4 people)
	Soccer	%27 (3 people)	%72 (8 people)
	Weightlifting	%75 (3 people)	%25 (1 people)
	Taekwondo	%71 (5 people)	%28 (2 people)
	Taekwondo P	%60 (3 people)	%40 (2 people)
	Volleyball	%14 (1 people)	%85 (6 people)
	Swimming	%71 (5 people)	%28 (2 people)



When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 33% of the athletes in the Artistic Gymnastics branch answered yes, while 66% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 80% of the athletes in the Athletics branch answered yes, while 20% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 41% of the athletes in the League Badminton branch answered yes, while 58% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 33% of the athletes in the M. Badminton branch answered yes, while 66% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 33% of the athletes in the Basketball branch answered yes, while 66% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 66% of the athletes in the Arm Wrestling branch answered yes, while 33% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 30% of the athletes in the Ice Hockey branch answered yes, while 69% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 20% of the athletes in the Curling branch answered yes, while 80% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 27% of the athletes in the Soccer branch answered yes, while 72% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 75% of the athletes in the Weightlifting branch answered yes, while 25% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 71% of the athletes in the Taekwondo branch answered yes, while 28% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 60% of the athletes in the Taekwondo-Poomsae branch answered yes, while 40% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 14% of the athletes in the Volleyball branch answered yes, while 85% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Do you feel pressure to protect your weight?" 71% of the athletes in the Swimming branch answered yes, while 28% of the athletes answered no.

	Branches	Myself	My Coach	Peer	Family	Society
	Art. Gymnastics	%33(1 people)	%66(2			-
			people)			
	Atl. Marathon	%40(2 people)	%40(2			
	Radminton I	%/1(10nconlo)	people)			944(1)
If you	Badminton M	%41(10people) %33(3 people)				704 (1)
n you	Basketball	% 33(3 people) % 22 (2 people)				%11(1)
Ves to the	Arm Wrestling	%33 (2 people)			%33(2)	/011(1)
previous	Ice Hockey	%30 (4 people)			7033(2)	
question.	Curling	%20 (1 people)				
who does this	Soccer	%27 (3 people)	%9 (1 peopl	le)		
pressure	Weightlifting		%75	(3		
come from?			people)			
	Taekwondo	%71 (5 people)				
	Taekwondo P	%40 (2 people)	%20	(1		
			people)			
	Volleyball	%14 (1 people)				
	Swimming	%57 (4 people)				%14(1)

Table 7. Regarding Who the Pressure is Coming From

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 33% of the athletes in the Artistic Gymnastics branch answered with "Myself" while 66% answered with "My Coach".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 40% of the athletes in the Athletics branch answered with "Myself" while 40% answered with "My Coach".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 41% of the athletes in the League Badminton branch answered with "Myself" while 4% answered with "Society".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 33% of the athletes in the M. Badminton branch answered with "Myself".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 22% of the athletes in the Basketball branch answered with "Myself" while 11% answered with "Society".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 33% of the athletes in the Arm Wrestling branch answered with "Myself" while 33% answered with "My Family".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 30% of the athletes in the Ice Hockey branch answered with "Myself".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 20% of the athletes in the Curling branch answered with "Myself".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 27% of the athletes in the Soccer branch answered with "Myself" while 9% answered with "My Coach".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 75% of the athletes in the Weightlifting branch answered with "My Coach".



When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 71% of the athletes in the Taekwondo branch answered with "Myself".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 40% of the athletes in the Taekwondo-Poomsae branch answered with "Myself" while 20% answered with "My Coach".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 14% of the athletes in the Volleyball branch answered with "Myself".

When the frequency chart is observed, it is seen that to the question "If you answered Yes to the previous question, who does this pressure come from?" 57% of the athletes in the Swimming branch answered with "Myself" while 14% answered with "Society".

Table 8. Regarding the Stress Fracture

Have you ever	Branches	Yes	No
experienced	Art. Gymnastics		%100 (3 people)
stress fracture	Atl. Marathon	%80 (4 people)	%20 (1 people)
as a result of	Badminton L	%16 (4 people)	%83 (20 people)
training or	Badminton M	%66 (6 people)	%33 (3 people) When
exhibition?	Basketball	%11 (1 people)	%88 (8 people) the
	Arm Wrestling	%33 (2 people)	%66 (4 people) freque
	Ice Hockey	%46 (6 people)	%53 (7 people) nev
	Curling	%20 (1 people)	%80 (4 people) chart
	Soccer	%27 (3 people)	%72 (8 people) is
	Weightlifting	%75 (3 people)	%25 (1 people)
	Taekwondo	%42 (3 people)	%57 (4 people) ed it
	Taekwondo P	%20 (1 people)	%80 (4 people) can be
	Volleyball	%14 (1 people)	%85 (6 people) central seen
	Swimming	%14 (1 people)	%85 (6 people) that to

the question "Have you ever experienced stress fracture as a result of training or exhibition?" 100% of the athletes in the Artistic Gymnastics branch answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 80% of the athletes in the Athletics branch answered yes, while 20% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 16% of the athletes in the League Badminton branch answered yes, while 83% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 66% of the athletes in the M. Badminton branch answered yes, while 33% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 11% of the athletes in the Basketball branch answered yes, while 88% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 33% of the athletes in the Arm Wrestling branch answered yes, while 66% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 46% of the athletes in the Ice Hockey branch answered yes, while 53% of the athletes answered no.



When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 20% of the athletes in the Curling branch answered yes, while 80% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 27% of the athletes in the Soccer branch answered yes, while 72% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 75% of the athletes in the Weightlifting branch answered yes, while 25% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 42% of the athletes in the Taekwondo branch answered yes, while 57% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 20% of the athletes in the Taekwondo-Poomsae branch answered yes, while 80% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 14% of the athletes in the Volleyball branch answered yes, while 85% of the athletes answered no.

When the frequency chart is observed, it can be seen that to the question "Have you ever experienced stress fracture as a result of training or exhibition?" 14% of the athletes in the Swimming branch answered yes, while 85% of the athletes answered no.

	BRANCHES	10	11	12	13	14	15	16	17
	Art. Gymnastics			%33	%33	%33			
	-			(1)	(1)	(1)			
	Atl. Marathon				%40	%20	%20	%20	
					(1)	(1)	(1)	(1)	
	Badminton L			%16	%12	%37	%33		
				(4)	(3)	(9)	(8)		
	Badminton M				%11		%66(	%11	%11
					(1)		6)	(1)	(1)
	Basketball		%11	%33	%22	%22	%11(		
How old			(1)	(3)	(2)	(2)	1)		
were you	Arm Wrestling		%16	%16	%50		%16(		
when			(1)	(1)	(3)		1)		
you first	Ice Hockey			%15	%23	%38	%23		
experien				(2)	(3)	(5)	(3)		
ced	Curling			%60	%20		%20(		
Menstru				(3)	(1)		1)		
ation?	Soccer	%9	%9	%18	%27	%9	%27		
		(1)	(1)	(2)	(3)	(1)	(3)		
	Weightlifting			%75	%25				
				(3)	(1)				
	Taekwondo			%42	%28	%14	%14		
				(3)	(2)	(1)	(1)		
	Taekwondo P			%60	%20		%20		
				(3)	(1)		(1)		
	Volleyball	%14(	%18	%42	%14				
		1)	(2)	(3)	(1)				
	Swimming		%14	%28	%14	%14	%28(		
			(1)	(2)	(1)	(1)	2)		

Table 26. First Menstruation Age of Women



When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 33% of the athletes in the Artistic Gymnastics branch answered with 12 years old, while 33% answered with 13 years old and 33% answered with 14 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 40% of the athletes in the Athletics branch answered with 13 years old, while 20% answered with 14 years old and 20% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 16% of the athletes in the League Badminton branch answered with 12 years old, while 12% answered with 13 years old, 37% answered with 14 years old and 33% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 11% of the athletes in the M. Badminton branch answered with 13 years old, while 66% answered with 15 years old, 11% answered with 16 years old and 11% answered with 17 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 11% of the athletes in the Basketball branch answered with 11 years old, while 33% answered with 12 years old, 22% answered with 14 years old and 11% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 16% of the athletes in the Arm Wrestling branch answered with 11 years old, while 16% answered with 12 years old, 50% answered with 13 years old and 16% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 15% of the athletes in the Ice Hockey branch answered with 12 years old, while 23% answered with 13 years old, 38% answered with 14 years old and 23% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 60% of the athletes in the Curling branch answered with 12 years old, while 20% answered with 13 years old and 20% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 9% of the athletes in the Soccer branch answered with 10 years old, while 9% answered with 11 years old, 18% answered with 12 years old, 27% answered with 13 years old, 9% answered with 14 years old and 27% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 75% of the athletes in the Weightlifting branch answered with 12 years old and 25% answered with 13 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 42% of the athletes in the Taekwondo branch answered with 12 years old, while 28% answered with 13 years old, 14% answered with 14 years old and 14% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 60% of the athletes in the Taekwondo-Poomsae branch answered with 12 years old, while 20% answered with 13 years old and 20% answered with 15 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 14% of the athletes in the Volleyball branch answered with 10 years old, while 18% answered with 11 years old, 42% answered with 12 years old and 14% answered with 13 years old.

When the frequency chart is examined, it is seen that to the question "How old were you when you first experienced Menstruation?" 14% of the athletes in the Swimming branch answered with 11 years old, while 28% answered with 12 years old, 14% answered with 13 years old, 14% answered with 14 years old and 28% answered with 15 years old.



	Branches	2	5	7	8	9	10	11	12	13	14	15	_
How	Art. Gymnastics Atl. Marathon					%2	%6 6 %2 0	%3 3	%6 0				
menstr uation	Badminton L		%4			0		%1 2	%7 9			%4	
cycles have	Badminton M			%1 1	%1 1	%1 1			%5 5				
you experie	Basketball	%1 1						%2 2	%6 6				
nced during	Arm Wrestling				%1 6			%1 6	%5 0				
1 year?	Ice Hockey				0	%1 5		0	%5 3	%7	% 23		
	Curling					5	%2 0		%8 0		25		
	Soccer						%9	%2 7	%3 6	%9	% 9	%9	
	Weightlifting					%5 0	%2 5	,	%2 5		,		Whe
	Taekwondo					%1 4	%1 4	%2 8	%4 2				n the frequ
	Taekwondo P				%2 0	·	·	%2 0	- %6 0				ency chart
	Volleyball				v			U	%7 1	%28			is exam
	Swimming							%1 4	%8 5				ined, it is

Table 27. Menstruation Frequency of the Athletes During the Year

that to the question "How many menstruation cycles have you experienced during 1 year?" 66% of the athletes in the Artistic Gymnastics branch answered with 10 times and 33% answered with 11 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 20% of the athletes in the Athletics branch answered with 9 times while 20% answered with 10 times, and 60% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 4% of the athletes in the League Badminton branch answered with 5 times while 12% answered with 11 times, and 79% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 11% of the athletes in the Badminton branch answered with 7 times while 11% answered with 8 times, 11% answered with 9 times and 55% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 11% of the athletes in the Basketball branch answered with 2 times while 22% answered with 11 times, and 66% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 16% of the athletes in the Arm Wrestling branch answered with 8 times while 16% answered with 11 times and 50% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 15% of the athletes in the Ice Hockey branch answered with 9 times while 53% answered with 12 times, 7% answered with 13 times and 23% answered with 14 times.

the



When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 20% of the athletes in the Curling branch answered with 10 times while 80% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 9% of the athletes in the Soccer branch answered with 10 times while 27% answered with 11 times, 36% answered with 12 times, 9% answered with 13 times, 9% answered with 14 times and 9% answered with 15 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 50% of the athletes in the Weightlifting branch answered with 9 times while 25% answered with 10 times, and 25% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 14% of the athletes in the Taekwondo branch answered with 9 times while 14% answered with 10 times, 28% answered with 11 times and 42% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 20% of the athletes in the Taekwondo-Poomsae branch answered with 8 times while 20% answered with 11 times and 60% answered with 12 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 71% of the athletes in the Volleyball branch answered with 12 times while 28% answered with 13 times.

When the frequency chart is examined, it is seen that to the question "How many menstruation cycles have you experienced during 1 year?" 14% of the athletes in the Swimming branch answered with 11 times while 85% answered with 12 times.

## DISCUSSION

Upon literature review, it was established that in Brown, Wengreen and Beals' study in 2014, in which they studied with high school athletes along with their trainers, the athletes and trainers lacked sufficient information regarding Female Athletic Triad. In the same vein, in the present study 98% of the participating athletes stated that they had never heard of the athletic triad before. Therefore, the results overlap with the literature.

When the answers given to the question "Do you have enough calorie intake?" especially Athletes, Weightlifters and Swimmers stated "No" at higher rates. Sleight et al., in their 2015 study underlined the importance of the eating disorder diagnosis and emphasized that the fact that generally athletes who have eating disorders see it as a reason for shame and hide it effects the clinical diagnosis process drastically. In the light of this point along with the serious amount of the "no" answers, it is recommended that the clinical check-ups of the athletes are carried out.

Athletes from the Athletics, Arm Wrestling, Weightlifting, Taekwondo, Taekwondo-Poomsae and Swimming have mostly answered the question "Do you feel pressure to maintain your body-weight" with "Yes". In the literature, Coelho et al., in their 2014 study state that the branches that are at high risk are generally branches in which the body fat percentage is important. They also argued that the most important step to take in order to prevent the athletes develop Female Athletic Triad is to diagnose eating disorder and prevent it from continuing. Athletes who answered "Yes" to this question are observed to be generally from branches where the body fat percentage is important or heft sports which divide the athletes into weight categories and this situation overlaps with the literature.

Over 50% of the athletes who answered "Yes" to the above "Do you feel pressure to maintain your body-weight?" question also stated that this pressure comes from their coaches. However, when the literature is reviewed it was not possible to find a suitable source for this situation.

It was revealed that to the question "Have you ever experienced stress fracture before?" the most athletes who answered with "Yes" belonged to the Athletics, Badminton and Weightlifting branches. In the literature review however, Warden et al., in 2015 stated that not only are the long-distance athletes have high rates of catching this sickness, they are also quite prone to catch it again. On the other hand, due to the fact that no other studies related to the stress fracture in Badminton and Weightlifting branches were found in the literature, a supplementary comparison was not possible.



The most serious fractures are observed to be occurring in athletes competing in Athletics, League Badminton, Arm Wrestling, Ice Hockey and Weightlifting, however, due to the fact that there is no study yet in Turkey and the World regarding the Female Athletic Triad which compares participants from all the elite branches, a related comparison could not be found.

Two athletes from Athletics answered the question "When did you first menstruate?" that it was around when they were 15-16 years old while the majority of participants from the League Badminton branch stated that they were 14-15 years old, while athletes from the Basketball branch answered that they were 14-15 years old, the participants who are National Badminton players stated that they were around 15-16 years' old and 1 student first menstruated when she was 17 years old. In all the other branches, the menstrual cycle was observed to have started around the normal age period which is 10-12 years old. In the literature however, in the study of Dadgostar et al., conducted in 2009 in which they compared many elite branches, 788 participating athletes were identified to be having late menarch age problems.

Athletes competing in Athletics, League Badminton, Badminton, Basketball, Arm Wrestling, Weightlifting, Taekwondo and Taekwondo-Poomsae answered the question "How many times a year did you menstruate?" with "9 and less". When the literature is examined, it is seen that in the study of Dadgostar et al., in 2009 which was conducted with the participation of 34 sports federations, athletes below the age of 20 were under the risk of oligomenore and amenore. The risk of amenore and oligomenore was observed especially in sports which are based on weight and endurance.

Athletes from the League Badminton, National Badminton, Basketball, Arm Wrestling, Ice Hockey and Taekwondo-Poomsae answered the question "How would you describe your menstrual cycle" with more irregular than 50%. Due to the fact that there were no studies regarding these branches, an argument was not possible. However, in the light of other studies and sources, it can be said that in sports branches where the athletes are loaded heavily they either lose their menstrual cycle or it becomes irregular. Therefore, the athletes in these branches developing oligomenore are associated with the heavy training they conduct.

### SUGGESTIONS

First of all, as a result of the study, informing the athletes who are under the risk of Female Athletic Triad through seminars prepared with the support taken from the Sports Education Department of the Youth and Sports Ministry along with the field experts of the sports federations and later spreading these seminars to all of the other branches can be suggested.

On the other hand, the health team of the national team can regularly inform the athletes regarding the Female Athletic Triad in the camps they participate, along with routine check-ups and the initiation of laboratory work regarding the subject in Turkey can be suggested.

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# Difficulties Experienced by Preschool Teachers Who Work with Children with Multiple Disabilites

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## ABSTRACT

The importance of preschool education for children with disabilities is revealed by both with the legislations and the results of various studies. Children with multiple disabilities (MD) have combination of the problems such as neurological disorders, sensory loss, physical disabilities, medical issues and the other developmental and/or behavioral problems and the preschool teachers who work with these children are experiencing lots of difficulties. In this case study, semi-structured interviews were conducted to determine the difficulties experienced by four preschool teachers working with children with multiple disabilities, and the data were analyzed with descriptive analysis. Four major and 13 sub-themes emerged out of the participants' statements. The findings showed that the preschool teachers who work with children with MD have parents related, teacher related, the children with MD related and the educational system related difficulties.

Key Words: Preschool education, preschool teachers, multiple disabilities, semi-structured interview.

## **INTRODUCTION**

Multiple disabilities (MD) refer the several disabilities, health and/or developmental problems and the number of children who have MD are increasing day by day (Ayyıldız, 2012; Chaudhari, Otiv, Chitale, Pandit and Hoge, 2003, Gresnight, 2007). These children have many limitations due to the combination, severity and the types of their conditions (Ayyıldız, Akçin and Güven, 2016; Thuppal and Sobsey 2006; Vlaskamp and Cuppen-Fontaine 2007). Most of these children have the combination of sensory loss (e.g. blindness/visual impairment, deafness/hearing impairment), intellectual disabilities, physical disabilities, autism spectrum disorders or autism like behaviors, epilepsy, chronic diseases (e.g. asthma, cancer, diabetes, anemia), metabolic problems, rare syndromes, behavioral issues and feeding and sleeping problems (Ayyıldız, 2007; Bahçıvancıoğlu-Yazıcı and Akçin, 2014; Best and Bigge, 2001; Thuppal and Sobsey 2006). With all these issues, the education of children with MD, become a very important and challenging topic especially for the teachers who work with them. The study which is conducted with the special education teachers who work with children with MD, revealed that the teachers need in-services trainings and seek collaboration opportunities. Results also suggested that the special education undergraduate and graduate programs about MD should be started. The study of Bahçıvancıoğlu-Yazıcı and Akçin (2014) pointed out that the parents also requested the qualified teachers for their children.

Although the importance of the special education training of preschool teachers is quite obvious (Başal, 2005), the studies revealed that the preschool teachers may have negative perceptions about children with disabilities. The study results, which assessed the preschool teachers' attitudes towards children with disabilities, showed that the negative thoughts and attitudes are related to the children's potential behavior problems and the type of disability (Gal, Schreur and Engel-Yeger, 2010). Another study noted that the preschool teacher candidates have negative thoughts about the special education. The preschool teacher candidates found special education as a difficult field to work (Uçuş, 2016). Considering the importance of preschool education, it is necessary to support teachers, especially who work with challenging children such as children with MD. However, it is first necessary to know the difficulties experienced by these teachers in order to determine what kind of supports that they need. So this study aimed to examine the difficulties experienced by the preschool teachers who work with children with MD.



#### THE STUDY

Case study approach was used in this study in order to determine the difficulties experienced by preschool teachers who work with MD children. Semi-structured interviews conducted with four preschool teachers who have experiences on working with MD children. The participants were determined by intensity sampling, which is a type of purposeful sampling method, in order to obtain in-depth information from the rich cases. The rationale of using intensity sampling is to gather information from the rich cases which are demonstrated the population intensely (Patton, 2002). Thus the participants selected purposely, cause they were aware the fact that they have been working or worked with MD children. The characteristics of the participants were given in Table 1 below.

			Table 1: The Ch	naracteristics	s of the Participants
Gend	er Age	Gradu	uation Exper	ience with	Workplace of working with
			MD children	MD chil	dren
Participant 1	Female	35	Undergraduate	11 years	Public school+Special Education
				and Rehabit	itaion Center
Participant 2	Female	33	Undergraduate	16 years	Public school+Special Education
			an	d Rehabilita	tion Center
Participant 3	Female	27	Undergraduate	4 years	Special Education and
				Rehabilitatio	on Center
Participant 4	Female	29	Graduate (MA or	n 6 years	Special Education and
	S	pecial	Ed.)	Rehabi	litation Center

Appointments with the participants made through by phone calls and interviews were held in the participants' work place or home. All participants were informed about the purpose of the study and signed the consent form. The interviews were audiotyped and transcribed verbatim. The duration of the interviews were 14 to 41 minutes. The data analyzed descriptively. From the important statements of the participants, the categories are identified. Then the categories are grouped to create the themes. After the revision of a specialist who is expert on qualitative studies the themes and sub-themes were finally identified.

#### FINDINGS

Four significant themes and 13 sub-themes emerged from the interviews' transcriptions. The major themes were 'Parents related difficulties', 'Teacher related difficulties', 'Children with MD related difficulties' and 'Educational system related difficulties'. In below the major and sub-themes were explained in detail and the some example statements were given in order to reveal the findings more clearly.

## **Theme 1: Parents related difficulties**

This theme was covered the statements of the parents' negative mood and feelings about the education of their children and the society's point of view, mostly high and rarely low expectancy level of the parents, the communication problems that the participants faced while they try to collaborate with the parents and the fact of the lack of awareness and knowledge of the parents in terms of their child's situation. It has four sub-themes as "the moods and feelings", "the expectancy level", "lack of support and consulting" and "the lack of awareness/knowledge. Some of the examples of participants' statements according to these sub-themes are below:

#### The mood/feelings

P 1. "In families are exhausted because of the society and the people's pity, repellent eyes. It caused them to get into the psychological collapse".

P 2. "...motivation of the families reduced because the child didn't achieve the goals while the years fly. So they are looking at the education like 'ok, do it, let's see how it will be going', but it is actually their fatigue and the motivation problem".



## Expectancy level

P 4. "I mean the families would have high expectancy sometimes. I mean they sometimes are not aware of their child or they trust the teacher too much. They wouldn't accept the condition of the child or have more expectancy from the teacher or sometimes it is opposite. They would have low expectancy. This is much rarer, but sometime as it is. ... and in this situation when I asked them to practice something at home, they said 'it doesn't matter if we practice or not, nothing will change".

## Lack of support and consulting

P 1. "I mean the most difficult thing for me uu is this. As much as I try to communicate with the families and tell them about their child's development, it is more, ... un little challenging for the family to feel insufficient about themselves. They are dealing with more than one disability, so they don't feel comfortable telling their problems to someone else but me, because I am their educator, a teacher. Of course it is so difficult for them to overcome this, but ihh there should be some expert or some places for getting help about that. A parent should only ask the teacher for help in terms of the education, but instead of this sometimes she is telling you the problems, the fight with her husband or the other family related problems. Sometimes she is telling you the problems about her other child, the sister of the disabled child. ... and you don't know what to say or do. You are hesitating". Lack of awareness/knowledge

P 3. "... awareness of the families is too low, I mean in terms of being aware of their child's situation".

P 4. "I mean sometimes things happen like, they are aware of their child, but they do not realize that education could change a lot of things".

## **Theme 2: Teacher related difficulties**

This theme has two sub-themes, 'lack of special field knowledge and experience' and 'collaboration needs with the other professionals' and it covers difficulties of preschool teachers in terms of the special field knowledge and the lack of experiences working with children with MD and the needs of working with the other professionals collaboratively. The examples of the participants' statements according to these sub-themes are:

## Lack of special field knowledge and experience

P 3. "I am having great difficulty in terms of reducing behavior problems, because I do not have training for this".

## Collaboration needs with the other professionals

P 1. "...in this sense, it is better to maintain an educational setting by collaborating with a physiotherapist or neurologist, whoever the child needs. The medical assessment should not be independent from the educational one. The doctor and the educator should know about their evaluations of the child. So they give me more support according to support the child's development. It is an deprivation for me for instance".

P 2. "...ut the needs... the Occupational Therapists are needed for example. The thing would be more easierfor us if there are Occupational Therapists in Turkey. The MD child has difficulty sitting and holding the spoon. The adaptation is needed. So I wish I could reach an Occupational Therapist or physiotherapist. And I wish I could know how or where to start to work with the child's intellectual disability"

## Theme 3: Children with MD related difficulties

'Disability', 'communication difficulties', and 'developmental issues' are the sub-themes of this theme. It includes the topics such as the severity, type and combination of the disabilities, the verbal communication and expressive language difficulties of the children with MD and the other developmental issues such as age of the child, developmental delays and problem behaviors. In below, some examples of participants' statements: <u>Disability</u>

P 2. "...visual impairment and additionally intellectual disabilities, visual impairment and intellectual disabilities, when they are together it is too hard to give the stimulants....Autism... Autism plus intellectual disabilities and visual impairment... When they are combined I am having serious difficulties".

## Communication difficulties

P 4. "Ok... For instance I have students who cannot talk. When the blindness and speech problems combined, I am getting only motor reactions and my practices with them could be limited. I mean the only way to evaluate something without vision is motor reactions. Some of my children do not speak at all, because of their disabilities and the oldest children I am working with, they are not speaking at all". Developmental issues



P 2. "If the child with MD is older, he could have behavioral problems and aggression. It is difficult to control that, sometimes. But if the children with MD come to us in early ages, the trainings are more effective and the outcomes are much better and it is also enjoyable to work with that age".

P 3. "They mostly are having problems in self-care skills, daily living skills and mostly toilet training and feeding themselves".

P 4. "With the child who has only one disability, visual impairment for instance, we can teach him everything. He could have some kind of developmental delays but we can teach everything. But if the child has MD, if he has two or three disabilities, learning is much slower and takes too much time".

## Theme 4: Educational system related difficulties

This theme has four sub-themes and they are 'lack of schools, curriculum, educational materials, resources, practical training, supervision', 'lack of early intervention system', 'lack of educational opportunities and experienced staff' and 'differences between the school for MD and the special education and rehabilitation centers'. This theme covers the issues such as lack of schools, appropriate curriculum, educational materials, Turkish resources such as books, handbooks in terms of children with MD, video trainings with the real cases, practical trainings and supervision opportunities, the early intervention system, the educational opportunities other than the schools, experienced staff and the differences between the schools and the Special Education and Rehabilitation Centers in terms of the length of the special education sessions and the effectiveness of the learning. The statement examples are in below:

Lack of schools, curriculum, educational materials, resources, practical training, supervision

P 1. "As the society, we are just internalizing the term MD. So it is a problem itself. No resources, no Turkish resources available, it is a problem and the children with MD have no opportunities for getting education. It is an huge disadvantage, ... because as far as I know, there is only one school for the children with MD in our country. Every child is a different, unique person. So they need different educational goals as well as the common ones. There should be a database which includes short term-long term goals for these children and not only the database, books and the videos also needed. We have plenty of cases actually. So we can get permission from the families and work on that cases for practical training purposes".

P 3. "... I mean, the lack of materials are great difficulty. Especially because we are working with visual impairment plus, intellectual disabilities, plus autism...".

Lack of early intervention system

P 1. "The early intervention centers should be started as soon as possible. Generally the lack of these centers, the lack of support that the parent can get from the different experts are the huge problems. Because the ages from 0 to 6 is a critical period by all means".

Lack of educational opportunities and experienced staff

P 2. "Eee...sometimes, in Turkey, the lack of the superior person or institutions to get support for such children is challenging. I mean where should I begin, which disability, which behavior should I choose first to work on...". P 4. "...in terms of education, there are problems. I think that some children cannot get the sufficient education at the school setting, because there are no educated staff for them".

Differences between the school for MD and the special education and rehabilitation centers

P 2. "I happened to feel more pleased while I was working with these children at the school setting... because the time we spent was much more. I mean seeing the child once a week, let's say twice at most ... I could be able to see the children 45 minutes once a week at the special education and rehabilitation center, but this is not enough for the children with MD".

## CONCLUSIONS

The results of the study showed that preschool teachers who work with children with MD are having problems in terms of,

The conditions of children with MD (the combination, severity and degree of disabilities and the developmental and/or behavioral problems, communication difficulties experienced with nonverbal children),

Educational system (The lack of early intervention services and school opportunities, appropriate education for the professionals, supervision and collaboration opportunities, resources and the non-recognition of MD as a special education category).

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Working with parents collaboratively and dealing with the issues related to the parents such as unstable



emotional states and high or low expectancy level.

- The lack of knowledge and necessary training about children with MD.
- There are also some other notable results emerged from the participants statements. These are:
- All participants referred children with MD as 'the children who have more than one disability/condition but they mostly mentioned about two to three disabilities/conditions. However, there is no limit for the number of disabilities/conditions that children with MD may have.
- One participant used the term 'doubled disability', but it is actually not the convenient term.
- Two participants referred the combined blindness/visual impairment and deafness/hearing impairment as MD, but it is deafblindness.

## RECOMMENDATIONS

Based on the results of the study, the following recommendations can be specified:

- In order the Ministry of Education to recognize MD as a formal special education category, academicians and non-governmental organizations need to work together and advocate the topic.
- The early intervention programs should be prepared and implemented to support the development of MD children starting from early ages.
- With the undergraduate and graduate programs and the specific training courses, the academicians and the teachers should be trained.
- Cooperation between parents and institutions, such as universities, schools, Special Education and Rehabilitation Centers, should be strengthened.
- All professionals who are working with children with MD should be encouraged to collaborate with the transdisciplinary understanding.
- Trainings about MD for both for the parents and the teachers should be provided.

### ACKNOWLEDGEMENTS

This study was supported by Istanbul Medeniyet University Research Fund as Project Number: S-BEK-2017-1090.

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# Digital Game Based Learning's (GBL) Impact on Foreign Language (FL) Vocabulary Cquisition

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## ABSTRACT

This study investigated the integration of the foreign language vocabulary learning app, Lingo Arcade, into a global learning instructional unit given to two first grade classes at XYZ school located in the Mid-Atlantic region of the United States. The Global Learning Lab needed to find a way to integrate more Spanish vocabulary into the curriculum. The study intended to answer how Lingo Arcade would impact foreign language vocabulary acquisition and what were students' perceptions of the app. This Mixed-Methods Action Research study incorporated a quasi-experimental design including one teacher and 24 students. Each group's mean was calculated and applied to a *t*-Test. The qualitative data was coded and triangulated. Lingo Group made a significant impact noting an average improvement on the posttest of 48%. However, the Traditional Group's gains were greater with an average posttest improvement of 64%. Further, according to the qualitative data analysis, Traditional Group's engagement scores were significantly higher. The results indicated that the Traditional methods are still superior to solely using the technology, but both methods will provide an efficient way to deliver new Spanish vocabulary in the Global Learning Lab.

Key Words: Game Based Learning, Global Languages, Spanish, Gamification, Lingo Arcade, Foreign Language Learning

DOI: 10.13140/RG.2.2.32197.14568

Entire Research Study: <u>https://www.scribd.com/document/359144940/Digital-Game-Based-Learning-s-Impact-on-Foreign-Language-Vocabulary-Acquisitio</u>

## TOPIC

The importance of learning a foreign language increases as new technology and innovation link our countries, businesses, industries and classrooms in ways unimaginable in the past. Companies can easily launch a satellite operation in India, Hong Kong, or Brazil for countless types of commercializations. Industries can now establish manufacturing in other countries to reduce the costs of shipping and logistics and depend on Skype, FaceTime and other communication software programs so team members can collaborate regardless of location. All levels of schools can now connect and collaborate with any other school in the world that has internet access. Students can also benefit from the technology through learning at any institution around the world. A student can live in Pittsburgh, Pennsylvania but have access to courses in Amsterdam, Holland. Students on one side of the world can even attain their degrees from universities on the other side of the world without ever using a passport. The world is becoming smaller by the minute. With the advent of this technology and innovation, learning a foreign language doesn't just open up doors for jobs and education, it's becoming a requirement.

The most opportune time for a person to learn a foreign language is in their primary years before and during elementary school. Linguists traditionally gave several windows of opportunity to acquire a foreign language. The first window was from ages 0-3; the second window ages 4-7 and the final window of acquisition ended at puberty (Birdsong, 1992). Further, by the time students typically start to study foreign languages in the United States (7th and 8th grade), the students have already developed an ethnocentric attitude and resist learning a different language (Knutson, 2006). Every year after puberty, it gets increasingly difficult to reach students. Recent studies now show that window starts to close quickly around the age of five years old emphasizing the need to start learning a second language even younger than previously thought (Meisel, 2009). Time is of the essence.

These windows of foreign language learning are critical. In the United States, it is uncommon for elementary schools to offer comprehensive foreign language programs. Most public elementary schools in the United States, particularly in the Midwest and rural regions do not offer a second language, and those that do are extremely limited in time an Crewoight @.TheoTunktsb Onding Jourciag of Endgoation at J scholelogy when they are most eager 183 and adaptable to new



languages puts American children at a huge disadvantage in the emerging global workforce compared to other countries where students speak two, three, four and more languages. This phenomenon was the impetus for a company called Little Linguists, Inc. which was founded 15 years ago in Pittsburgh, Pa (Little Linguists, Inc., 2017). The owner established the company, because she could not find second language acquisition programs for her young children.

Being an international marketing manager for a major chemical company, she knew how important speaking foreign languages was in this new global community. She started her own children in seven languages and they each gravitated to a different one (Little Linguists, Inc., 2017). Unfortunately, 15 years ago, there was very little published material for teaching foreign languages to young children, and there was no technology that could be integrated into the curriculum. In fact, there were no curricula or lesson plans for elementary aged foreign language learning. Further, very little research had been done on bilingualism in America. The owner started developing materials, lessons, and curriculum and created a format based on research from leading linguists in the United States (Little Linguists, Inc., 2017). The program spread throughout Pennsylvania and was implemented in 40 schools as before or after school enrichment programs (Little Linguists, Inc., 2017). The classes were ten weeks long and met once a week for one hour. Students were able to get a taste for the language and could at least communicate with simple greetings and everyday conversational exchanges in the target language. They also were able to attain very good pronunciation for future, formal language training.

Five years ago Little Linguists instituted a program called the Global Learning Lab which focuses more on exposing students to many languages and cultures and trains them to adapt and pick up on several languages at one time. One school in in the Mid-Atlantic region has adapted this Global Learning Lab and is going on its fifth year of conducting the class as a special in which grades kindergarten through sixth meet once a week for one hour. The students learn a little bit of Spanish every week because of its practicality, but after the 10-15 minute Spanish conversation segment, the students virtually travel to another country for the remainder of the class. Every 10 weeks or so the country changes. Regardless of the country of focus, Global Learning Lab continues with the Spanish language the first 10-15 minutes of every class, so by the time the students get to middle school and take Spanish everyday, they will have a solid, communicative foundation. They will be comfortable and uninhibited to ask and answer questions in Spanish.

Unfortunately, 15 minutes a week is very limiting in terms of how much Spanish students can learn and retain. The students can ask and respond to, "How are you?", "What's your name?", "How old are you?", "What is the weather like?", "What day is it?", and they can introduce one another. It would be extremely beneficial to take advantage of these small linguistic windows by teaching more vocabulary, so the students would have a much stronger foundation going into the junior high and high school.

## **Problem Statement**

Communication is one of the five pillars of Global Language Learning according to ACTFL (American Council for Teaching Foreign Languages) (ACTFL, 2017). The other four include Culture, Connections, Community, and Comparisons. The current format in the Global Learning Lab at XYZ school does not allow for the first grade students to efficiently and effectively add new Spanish vocabulary to their repertoire. According to the end of the year verbal assessment, students are limited to only a handful of scripted conversations and have not acquired any new vocabulary. This greatly inhibits their advancement towards more complex conversations in Spanish, which limits their potential and the school's objectives of nurturing global citizens.

#### **Problem Background and Causes**

Learning new foreign language vocabulary for the first time can be a tedious and long process. It is a process that requires rote and contextual learning. There is a constant loop in foreign language vocabulary acquisition between the short term working memory and long term memory (Wen, Borges, & McNeill, 2015). Connecting this loop is an arduous process.



In the classroom, there is a certain amount of rote learning that needs to occur for the student to gain a foundation with which s/he can build his/her foreign language vocabulary into this loop of pre-learning, learning and reinforcement into long term memory. Little Linguists, Inc. incorporates a combination of multisensory techniques when teaching new foreign language vocabulary (Little Linguists, Inc., 2017). Limited English is used when introducing new vocabulary and Krashen's natural model of vocabulary acquisition is adhered to the majority of the time (Krashen, 1983). The goal is for the student to identify the Spanish code for the picture and the visual (Communicative Approach) rather than directly translate from the English to the Spanish and then attach the visual which is the Direct Translation Method (Richards & Renandya, 2002). The Direct Translation method is inefficient, ineffective, and it is no longer recognized in foreign language classrooms as the premier method to teach foreign language (Krashen, 1982). Students retain more when engaging with the vocabulary word in its natural context.

Although these methods have been proven to be more effective in teaching foreign language vocabulary, they can also cause confusion and boredom to the student in which case the learner completely shuts down to any new foreign language words being introduced because of overstimulation (Dacian & Dolghi, 2016). Consequently, students will often let their minds wander when learning new vocabulary and completely disengage from lessons that use these generally accepted methods of teaching foreign language vocabulary. This phenomenon can also be attributed to the elementary aged child's attention span. It is extremely difficult to teach foreign language vocabulary to students with a limited attention span, because it takes time to connect the visual, auditory and tactile requirements of learning new foreign language vocabulary. Students in elementary school are easily distracted and have limited attention in learning this new vocabulary (Matusz et. al., 2015).

Most of the research on Krashen's foreign language learning approach and the naturalistic methods of teaching vocabulary was done using secondary school participants, and did not include elementary learners (Dacian & Dolghi, 2016). Since the research did not include elementary aged learners, no one truly knows how students of this age can most efficiently learn foreign language vocabulary. Given the young learner's shorter attention span, the most efficient way to teach foreign language vocabulary to elementary school aged students is ambiguous.

The Global Learning Lab tries to adapt all of the language and culture units to the learners' age and learning styles. The units are sensitive to short attention spans and potential confusion caused when using these traditional methods (best practices). One of the goals of the Global Learning Lab is to nurture future global citizens by opening the students' minds to new languages, cultures and belief systems. Another goal is to give the students enough of a Spanish foundation in order to communicate in simple, everyday conversation by the time they enter middle school. Often, these two objectives are in conflict because students have very little time in Global Learning Lab to accomplish such massive objectives. It takes a great deal of time and repetitions to learn new vocabulary needed to hold a simple, everyday conversation in Spanish. Given the format of Global Learning Lab, it is extremely difficult to efficiently integrate this meaningful Spanish vocabulary learning. Each year Global Learning Lab virtually visits four foreign countries. The Global Learning Lab rotates three non-Spanish speaking countries and one Spanish speaking country. Refining Spanish conversation and learning new vocabulary is critical when the rotation is on the Spanish speaking country. Time is of the essence, and extending the time in Global Learning Lab is not an option. There is only this ten week period during the year when the entire instructional hour is devoted to Spanish. It is critical to engage the students in meaningful vocabulary activities to maximize the amount of vocabulary they learn and retain.

In summary, the problem of introducing and acquiring new Spanish vocabulary into the Global Learning Lab to learners of this age is complex. There are many obstacles to consider including the multifaceted process of acquiring new foreign language vocabulary, short attention spans these learners have in elementary school, the format of the Global Learning Lab, and the fact that all of the FL learning must take place in school in a very short amount of time.

## **RESEARCH QUESTIONS**

The following research questions will be answered upon completion of the research study:

1. What is the impact of adding the Spanish vocabulary app, Lingo Arcade, on first grade student's Spanish vocabulary acquisition at XYZ school?



2. What are the first grade learners' perceptions of integrating the Lingo Arcade app into the Global Learning Lab?

#### **Topic and Problem Conclusion**

There is no doubt that our world is increasingly becoming smaller every year through air travel, technology, and immigration. The United States is only beginning to feel the impact of a global workforce. In generations to come, students will be competing not only with other American students, but students from across the globe that are far better equipped in communicating in different languages. If schools had a way to simply and efficiently introduce new languages at a young age, our American students would not be at such a disadvantage. We need empirical evidence to demonstrate how we can teach these languages more efficiently given the time and resource constraints schools have.

Particularly in XYZ school, if the students do not add to their vocabulary, their communication skills in Spanish will become static. They will not be able to create their own sentences in later units nor will they be able to have meaningful conversations with Spanish speakers when opportunities present themselves. Many of these students continue on with mission work overseas, many of them in Mexico.

#### **Review of the Literature**

#### **Technology Integration in the Foreign Language Classroom**

The amount of technology available today is vast and growing exponentially. There are some outstanding apps and software programs that can assist students with vocabulary learning in the foreign language classroom. The problem is finding empirical evidence that supports the claims that this technology boasts. There is plenty of anecdotal evidence, but there are only a handful of experimental studies done on these language apps (deHaan, 2010). Additionally, the empirical evidence that does exist on these apps is from a laboratory experiment and is somewhat flawed. No research has been conducted in a classroom setting and combined with instruction from a live teacher (Ahmed, 2016).

This literature review reveals several themes within the integration of technology into the foreign language classroom. The most promising method of integrating technology in the classroom emerged as a theme in this literature review. Game Based Learning shows great potential in assisting foreign language teachers in delivering basic vocabulary learning in a contextual manner using visuals. Finally, the only app that researchers have analyzed using quantitative, experimental based research is Duo Lingo, and even this research is flawed and questionable. Overall, there is very little empirical evidence foreign language instructors can depend on when selecting technology to use in the foreign language classroom.

*CALL- Computer Assisted Language Learning.* CALL, Computer Assisted Language Learning, is the inclusion of technology to assist and enrich foreign language learning. Many applications fall under the umbrella of CALL including ITS (Intelligent Tutoring Systems), GBL (Game Based Learning) and ASR (Automatic Speech Recognition). Specifically defined, CALL is "any process in which the learner uses a computer to improve foreign language competence." (Scott & Beadle, 2014, p. 19). Fundamentally, CALL provides a way for the learner to interact with technology, but it is learner led. There are three types of interactions with the computer: The learner interacts with three different subjects- content, instructor and another learner (Scott, Beadle, 2014).

CALL can be integrated into many platforms including but not limited to the PC, Chrome books, PDA's, smart phones, electronic dictionaries and any other electronic device that supports programs for language learning. Learners can use a variety of applications online either synchronously or asynchronously. Offline applications include CD Roms, DVD's and software loaded onto a PC. One of the advantages of CALL is it is flexible and available at any time. It also promotes self-guided learning. Learners can move forward as they master skills, but they can also review as much as needed until they obtain competence in the specific area. The applications of CALL are vast.



CALL's most promising applications are Chat and (ITS) Intelligent Tutoring Systems (Golonka, 2014). There is empirical evidence that shows Chat is a good alternative to in-person interaction in the foreign language. It enhances the phonological working memory (Golonka, 2014). This is particularly important in vocabulary learning where it is critical to loop the short term working memory with long term memory equipping the student to form more complex language. Chat also is shown to lower foreign language learning anxiety and results in more words produced with more complex sentence structures (Golonka, 2014). One of Krashen's significant findings in the best practices of foreign language learning is minimizing this affective filter (Krashen, 1983). The affective filter is the anxiety that naturally occurs when one is learning a new language. It is a type of fear that learners experience when trying to speak a new language in which they are not confident. Krashen's idea of lowering this affective filter by giving learners confidence through positive reinforcement, encouragement, and accepting natural mistakes that occur when using a new language is part of today's best practices in foreign language learning (Krashen, 1983). Finally, there are significant gains in speaking, self-correction, and "focus on form" method of foreign language learning (Scott & Beadle, 2014). This, also, corresponds with today's best practices of lowering the affective filter and adhering to the Communicative Approach to language learning.

Intelligent Tutoring Systems (ITS) also look promising according the solid research studies. ITS includes gamification apps and software also referred to as GBL or Game Based Learning programs. The most significant advantage to using Intelligent Tutoring Systems over a traditional method of foreign language learning is that the feedback is instantaneous and repetitive (Golonka, 2014). This instant feedback adheres to best practices in foreign language learning in a way that a live instructor cannot. A live instructor in a classroom setting cannot always give instant feedback especially in a larger classroom. Intelligent Tutoring Systems also benefit students in vocabulary learning and practice. Unfortunately, most Intelligent Tutoring Systems lack cultural learning, authentic experiences, human engagement, and collaboration. They often contain incorrect content, provide inadequate screen graphics, and the overall whole language learning (Jašková, 2014). Excluding cultural aspects of the language fails to adhere to best practices of foreign language learning. Best practices in foreign language learning include the "5 C's"- communication, culture, connection, comparisons, and community (Alley & Heusinkveld, 1998).

Another limitation to Intelligent Tutoring Systems is that it can create teacher dependence and limit other teaching methods. Many teachers fall into a trap thinking that the learners are so engaged in a computer program they must be learning. Beware. "It is easy to blindly accept something as valuable for language learning simply because it involves language and problem solving and students enjoy it... (but) selection should be done on the basis of whether it really promotes language learning." (deHaan, 2010). Other restrictions to CALL include limited access to technology, teacher resistance to using CALL, lack of training and professional development on emerging technologies (Scott, Beadle, 2014).

**DGBL-** Digital Game Based Learning. DGBL is the use of computer or digital games in the classroom. DGBL shows the most promise out of all the applications in technology and foreign language learning. The language apps available today include many simple memory games, flashcard apps, storybook apps and counting and coloring apps for basic language acquisition. However, the more interesting language apps are those that are intuitive and teach the language in a holistic way. From a linguistics standpoint, apps that do not translate into English are better than those that simply do a direct translation with no visual input. These types of apps adhere to the best practices in foreign language learning according to the Communicative Approach. Direct Translation is no longer the accepted approach to learning a foreign language, and apps that simply use the Direct Translation method are not up to standard (Krashen, 1983). The visual based apps, however, do adhere to best practices in the rote learning segment of foreign language acquisition. These intuitive and visual apps include Rosetta Stone, Lingo Arcade and Chungaboo. Their prices vary from hundreds of dollars (Rosetta Stone) to free, which Lingo Arcade and Chungaboo all offer the primary skills for free.

There are many advantages to using DGBL in the foreign language classroom. These advantages include its "JIT" or "Just In Time" nature of bringing learning to learners whenever and wherever it becomes needed. Game Based Learning can individualize learning, and its use can be designed as an individual or collaborative learning experience. These apps are adaptable, provide immediate feedback and focus on repetition and recall of prior knowledge. Each of these attributes adheres to best practices in foreign language acquisition.

These apps are shown to improve problem solving, critical thinking, and retention while increasing immediate feedback and motivation to the learner (Scott & Beadle, 2014). Another key feature of DGBL includes self-directed learning and spaced repetition which derives from algorithms that are detected when user forget words or phrases (Munday, 2016). The games are intuitive and go at the learner's pace. Students have the option to learn autonomously which serves many students (Ahmed, 2016). This minimizes the stress and anxiety students often feel when learning a foreign language thus reducing Krashen's affective filter (Krashen, 1983). This is also advantageous for the recall process. If a student forgets a vocabulary word after a couple of weeks, the program will help the student relearn that word. The algorithm is constantly adding new material, but reinforcing the old material in an intuitive way that doesn't draw attention to the error which makes the learner feel like s/he failed (Crombie, 2013).

All the literature reviewed touted that CALL (Computer Assisted Language Learning) apps significantly increased attitude and motivation. Students seem particularly motivated when iPads come off the carts or if a teacher announces part of the day will be spent on a new software application (Crombie, 2013). These apps have a captive audience, and they motivate the students to learn while having fun. These apps boost a student's confidence with built in rewards. This is particularly important in reducing the affective filter. The settings on the apps can also accommodate specific needs of each individual student which is particularly helpful in differentiated instruction and/or an inclusive classroom which integrates students with special needs. The background music and sounds can be turned off. This background music and sounds are meant to be a small distraction to make it more authentic and challenging for the student. However, this can frustrate a student with language deficiencies. It is quite simple to just turn off the background noises or music. The instructor can also adjust the speed, repetitions, amount of time spent on each set of cards and the number of cards clustered together at one time. These adjustments make the environment more inclusive for learners with special needs without making a big fuss or drawing attention to their challenges.

There are several limitations to DGBL including lack of productive knowledge generation, cognitive overload, teacher dependence, accuracy, authenticity, availability, teacher training, teacher dependence, implementation, and its limitations in delivering all of the standard "5 C's" (Communication, Culture, Connections, Comparisons, Community) in foreign language learning (Alley & Heusinkveld, 1998).

One significant criticism of DGBL is that students' focus is on receptive knowledge, and productive knowledge is not emphasized (Lu, 2008). This is significant when trying to build new vocabulary into working memory and then connecting it to long term memory. Another criticism of DGBL is the cognitive overload that can inhibit learning. A significant finding in two studies showed a difference in vocabulary learning between watchers and players of the digital foreign language games (Lin, 2015; deHaan et al., 2010). Players recalled fewer vocabulary words than the watchers of digital foreign language learning games. The reason is cognitive overload (deHaan et al., 2010). It takes so much cognitive energy for a player to manipulate the game, remember the vocabulary and translate that into another manipulation that the focus is more on the play rather than the learning. The players had a very difficult time multitasking when learning the foreign language through the interactive games. This is something to consider when establishing any type of app into the classroom, especially a classroom with students who have dyslexia or other language learning deficiencies. The model of every student having his/her own iPad or device may be counterproductive. These studies show that students in groups of two, three and even four players taking turns learned more effectively with less stress. Lin's study demonstrated that "watchers" yielded better vocabulary recall immediately after treatment and on the delayed posttest, and the multiplayer group outperformed the individual group in the vocabulary section of the assessments (Lin, 2015). deHaan found that this "hyper-engagement" is counterproductive and that foreign language needs to be "comprehended, integrated with prior knowledge, and used purposefully" which to date, Game Based Learning does not provide for (deHaan et. al, 2010, p. 85).

Further, deHaan declared that "more explicit instruction may support a more complete acquisition of vocabulary" (deHaan et. al, 2010, p. 86). This is significant evidence supporting collaborative and explicit learning when implementing technology into the classroom.

*Duolingo*. Duolingo is the premier app being used in secondary language classes across the globe. As of 2016, there were more than 100 million Duolingo users in the world (Ahmed, 2016). Luis von Ahn, founder and creator of Duolingo, calls Game Based Learning, Games with a Purpose or "GWAP". Duolingo is based on an earlier approach to foreign language called the Grammar Translation Approach which was popular from the 1920's until the 1960's when Stephen Krashen introduced his Communicative Approach to foreign language learning (Krashen, 1982). The fact that von Ahn has regressed, in many eyes, to an approach that is highly criticized in linguistic circles presents a fundamental problem in Duolingo's efficacy. Can a program based on an outdated foreign language method be effective? The studies, albeit limited and criticized, state that it is effective. The pros of using Duolingo are that it is self-directed, user friendly, multicultural, collaborative, learner controlled and that it provides instant feedback and motivation for beginning learners (Garcia, 2013). However, the app counters today's best practices which supports the Communicative Approach to foreign language acquisition.

Duolingo commissioned research team Roumen Vesselionov, PhD of Queens College and John Grego, PhD of the University of South Carolina to conduct empirical evidence based study on the effectiveness of Duolingo program in Spanish in 2012 (Vesselinov & Grego, 2012). The study was conducted over an eight week period on a random sampling of 196 people who were non-Hispanic, English speakers, not advanced in Spanish (Vesselinov & Grego, 2012). The research was a quantitative method of study consisting of pretest and posttest data, a reliable instrument called WebCAPE (Web based computer adaptive placement exam) conducted by Brigham Young University and the Perpetual Technology Group with a validity correlation coefficient of .91 and a reliability (test-retest) value of .81, both of which are quite high (Vesselinov & Grego, 2012). The main limitation of the study was the amount of time students spent using Duolingo which ranged from 2-30 hours, the average being 22 hours. The researchers accounted for this limitation by integrating the time variable into the equation measuring improvement using Duolingo (Vesselinov & Grego, 2012). The results showed significant improvement in vocabulary recall, pronunciation, grammar learning, motivation, and independent learning on the positive side, but also showed some confusion with translations. Overall, Vesselinov and Grego claimed that using Duolingo 34 hours is the equivalent of a college level I Spanish course (Krashen, 2014). Krashen claims the study exaggerates its effectiveness and questions the research methodology, the participants' background, age, and education level (Krashen, 2014). Krashen believes in the living language and is a huge proponent of the Communicative Approach to foreign language learning (Krashen, 1982). It is understandable that Krashen would be very skeptical of any evidence supporting the use of an approach that runs counter to the Communicative Approach he developed. This is shortsighted. No one is suggesting that these apps replace the Communicative Approach to foreign language learning. What is being suggested in most studies is that these types of apps be integrated into the foreign language classroom for enrichment or to be used as tools to enhance lower level skills acquisition.

#### SUMMARY

After careful review of the current literature on technology in the foreign language classroom, and considering the accepted model for the most effective way to learn foreign languages (Communicative Approach), DGBL shows the most promise in assisting the foreign language instructor in delivering new vocabulary in an efficient and effective manner. Potentially, educational apps that make rote learning vocabulary visually stimulating and engaging could hold younger students' attention longer. There are countless foreign language learning and game based learning apps, but the one app that is most suitable for young elementary students is called "Lingo Arcade". This app includes the recommended visual with the foreign language word and deemphasizes Direct Translation fitting the Krashen model of foreign language learning (Krashen, 1983). It offers 175 levels and 3000 of the most common Spanish words in usage. The photos are striking, accurate and descriptive. There is one "teaching" or "review" session and then five games integrated into the app for addictive and game-based educational fun. The app allows for multiple users which is ideal for a classroom environment and collaborative learning.



The game boasts an intuitive learning algorithm which was developed by a Stanford graduate student (Alligator Apps, 2017). The algorithm allows for the app to go at the learner's pace. The game progresses as the learner progresses.

Although these apps look promising, they are still lacking in the fundamental "5 C's" of foreign language learning as universally accepted as best practices in the foreign language community (Alley & Heusinkveld, 1998). These games are not meant to replace an entire curriculum or instructor. They are merely a tool that can be used for enrichment, and can assist in one component of foreign language learning- new vocabulary acquisition.

## **RESEARCH METHODOLOGY**

#### **Research Design**

This study is based on the Action Research model, methodology and design. Step by step, this study carefully employs each aspect of Action Research's purpose, research questions, philosophy and assumptions, sampling methods, data collection methods, research methods, quality criteria, data analysis, and report writing.

#### **Participants**

Students participating in this intervention were first graders between the ages of six and eight. They come from middle to upper middle class Christian families where the majority comes from two parent homes. The school is a small, private, and Christian school located in the Mid-Atlantic region of the United States and hosts grades Pre-K through sixth. The school's enrollment is 230 students, and the average student to teacher ratio is one to 12. The first grade classes have 12 students each with an even distribution of boys and girls. All 24 students will be participating in the study. For the most part, students are well behaved, motivated and have a supportive home and family. None of the students have an IEP (Individualized Educational Plan). The classroom is an inclusive classroom and incorporates differentiated instructional techniques when required.

All students have had conversational Spanish since Kindergarten and have learned the colors, numbers and basic greetings. Their affective filters have been minimized through constant positive reinforcement and the use of natural language acquisition (Krashen, 1982). Students seem to love attending Global Learning Lab and look forward to the activities.

#### **Sampling Techniques**

This study used convenience sampling model, with a homogenous sample set. The study was limited to using participants in one school in the first grade. The roster is preset. However, to strengthen the study, the control and treatment classes were selected randomly. There were two classes with 12 students each. One of these classes in each grade was chosen randomly to receive the treatment (Lingo Arcade) and the other class in that grade continued with the traditional methods of foreign language instruction.

#### Intervention

Students at XYZ school have Global Learning Lab (GLL) once a week at the same time for one hour. Over an eight week period, students will start the class with 10-15 minutes of Spanish conversation. After the conversation segment of the class, the unit will introduce vocabulary from the first two levels of the Lingo Arcade app to both the intervention and control group. The remainder of the Global Learning Period will be spent exploring the cultural and geographic aspects of the language while integrating new vocabulary when appropriate.

*Conversation segment of class.* The conversation segment consumes roughly 15 minutes of the class time. In the first grade, the students regularly use five conversational exchanges during the conversation segment of the class. The students can ask and respond to in Spanish: "How are you?"; "What is your name?"; How old are you?"; What is the weather like?"; and, What day is it?".

*Vocabulary segment*. After the conversation segment, there will be two different procedures and language learning methods used to introduce and practice new Spanish vocabulary (Group Lingo and Group Trad). The vocabulary is representative of the most commonly used nouns and verbs in the Spanish language. The unit will cover two levels on the Lingo Arcade app which includes 31 vocabulary words, 16 nouns and 15 verbs (Appendix A). The nouns include the singular and plural, so there are only eight main nouns plus their plural. Neither the app nor the unit will include articles. The verbs are all in infinitive form. No conjugation will take place in this instructional unit. These 31 new Spanish vocabulary words will be introduced to both groups (Appendix A). For 15 minutes a session, at the same time each week according to the students' class schedule, students will be introduced to and practice the new Spanish vocabulary. "Group Lingo" will use the app, Lingo Arcade, to learn the vocabulary while the control group called "Group Trad" will learn the vocabulary using traditional foreign language vocabulary learning strategies.

**Treatment group**. The students in the treatment group (Group Lingo) will secure an iPad with his/her corresponding number from the iPad cart. iPads should be numbered 1 - 12. Each student's iPad number needs to be recorded in the class list in the excel spreadsheet, and the student should always log in on that iPad. The app, Lingo Arcade, should also be preloaded onto all of the iPads. Additionally, each student has their own login and user ID on that iPad. None of the users preloaded within the app have any personally identifiable information. The user names are the student's alias per this study. Progress is automatically tracked by alias.

The procedures for the treatment group simply include the play on the app itself and making adjustments to the settings when needed. Lingo Arcade can be adjusted according to learner's needs. The teacher must document any adjustments in the settings and explain the reason for the adjustment.

The app itself has one review segment and then five games that need to be unlocked as students get right answers. As students get correct answers, a hexagon is filled in next to the picture in the student's "score card". Once all eight hexagons are filled in, the learner receives a trophy meaning the learner has semi-mastered this word and can move onto new words. If student answers incorrectly, hexagons will be erased. Once a learner receives a trophy, that doesn't mean the learner will never see this word again. It simply means the word will be shown less frequently. If the learner forgets this word in future games, the algorithm will force the word to appear more frequently again and the learner will lose his/her trophy until the word is successfully relearned.

**Control group.** The control group (Group Trad) will be learning the same vocabulary as the intervention group at the same time, however there will be no use of the DGBL app, Lingo Arcade. This group will be learning the same vocabulary with the same visual prompts as the Lingo treatment group, however the delivery of the vocabulary will be using traditional foreign language learning methods. The instructor will introduce eight vocabulary words each week using the chunking and repetition methods. The instructor will introduce two-three words at a time using the slide show on a big screen having students repeat each word at least three times. When all eight words have been displayed and repeated at least three times each, instructor should randomly display each vocabulary word and have the class as a group try to remember the name of the word. This procedure should be repeated each session until all of the vocabulary has been introduced (if the instructional unit is on time, which would be session four of the study). Every consecutive session the teacher needs to review the previous vocabulary and then introduce another eight pictures and words.

After vocabulary has been introduced, the teacher can choose one of the traditional reinforcement games used in the traditional foreign language classroom. These include "Go Fish", "Snap", "Around the World", "Memory", "Jeopardy", "Fly Swatter" and "Bingo". Total time for introduction, repetition and play with the vocabulary words is 15 minutes per session. The remainder of the class, just like the intervention group, will be the cultural part of the lesson integrating vocabulary where appropriate.



*Cultural segment.* As with all sessions in the Global Learning Lab, the final segment of the class is a unit which delves into the cultural aspects of the various countries the students visit. In this case, the students will be visiting a Spanish speaking country so that they can maximize their time in the Spanish language and the Spanish and culture will parallel each other. The students will be learning the geography, music, food and demographic information on Mexico City.

### SUMMARY OF RESEARCH METHODOLOGY

This study parallels the Action Research design and incorporates both quantitative and qualitative research techniques. It employs a quasi-experimental design by using quantitative instruments in the form of an objectives assessment for the pretest and posttest. The mean of the two will be calculated and inserted into a *t*-Test equation to determine if the results of adding the treatment of Lingo Arcade are significant. Further, in order to gain insights into the learners' perceptions, their engagement (positive and negative) will be documented in an observation checklist. Those results will be corroborated with observation notes that the researcher/teacher will be documenting every session.

#### RESULTS

#### **Results Overview**

Data in this investigation was collected from four different sources using both qualitative and quantitative instruments. Quantitative data was collected from a pretest, posttest, and observation checklist. Qualitative data was collected from an instructor's observation journal kept during the unit of instruction. The pretest and posttest were the same instrument with two segments which measured the student's recall of a visual when given a Spanish prompt and the Spanish word when given a visual prompt. The observation checklist included items that measured the engagement of the students in both groups. Finally, the journal contained more detailed information about logistics and events during the classes.

#### Table 1

	Pretest-Posttest Mean								
	Spa-Vis	Vis-Spa	Overall						
Lingo	0.36	0.62	0.48						
Trad	0.6	0.71	0.64						

Figure 1

Mean Pretest-Posttest Improvement Lingo Versus Traditional



Figure 1 summarizes the mean pretest-posttest scores in the Lingo and Traditional Groups. The overall mean pretest-posttest scores indicate that the Traditional Group presented more significant improvement over the Lingo Group. The Traditional Group's mean score was 64% while the Lingo Group's mean score was 48%. That is a 16% differential in favor of the Traditional Group. When looking at the engagement scores and the instructor's observation journal, this difference is not surprising. The students in the Traditional Group were more engaged, motivated and excited about learning the new vocabulary. They worked collaboratively in small groups and teams embracing the Constructivist model of learning. The Lingo Group displayed signs of boredom, distraction and disengagement. The novelty of using the iPads quickly wore off, and the games became tedious and monotonous. Additionally, the Lingo Group pretest scores were 10% higher than the Traditional Group pretest scores. However, when accounting for this 10% differential, the overall Traditional Group's pretest-posttest improvement was still 6% higher than the Lingo Group's scores. This demonstrates that the Traditional Group's instruction was more beneficial and effective than the Lingo Arcade app instruction.

## Engagement data.

Table 2Observation Template- Engagement Results- Group Lingo

					Lingo G	Broup-En	gagment				
Class #	1	2	3	4	5	6	7	8	9	10	
Repeats all required vocabulary											
Repetitions	Pretest	0	0	0	0	0	0	0	0	Posttest	0
Accepts pronunciation corrections by											
repeating with better pronunciation	Pretest	0	0	0	0	0	0	0	0	Posttest	0
On task	Pretest	2	2	1	1	1	1	1	1	Posttest	10
Participates fully	Pretest	0	0	0	0	0	0	0	0	Posttest	0
Responds correctly in game	Pretest	0	0	0	2	1	1	1	1	Posttest	6
Distracted	Pretest	2	2	1	1	0	0	0	0	Posttest	6
Bored	Pretest	2	2	1	1	0	0	0	0	Posttest	6
Confused	Pretest	2	2	1	1	2	2	0	0	Posttest	10
Cooperates with others	Pretest	0	0	0	0	0	0	0	0	Posttest	0
		8	8	4	6	4	4	2	2		38

Table 2 is the Student Engagement table for Group Lingo. This table breaks down by class specific behaviors that represent students' engagement in the foreign language vocabulary acquisition. Group Lingo did not receive a score for two of these behaviors, because the iPad app, Lingo Arcade, did not allow for collaboration or pronunciation. All students received "0" points for these behaviors. This is a significant deficit in these apps for foreign language learning which was why it was important to document when comparing to a group that would have collaboration and pronunciation corrections. Overall, the Lingo Group received an engagement score of 38 out of 144 possible points. Each positive behavior when consistently exhibited was worth 2 points. Each negative behavior (districted, bored, confused) was worth 2 points when it was not consistently displayed. It is interesting to note that as the classes continued, the engagement levels dropped. They started out at 8 and ended up at 2. This is consistent with journal entries stating the students, after a few sessions, were asking how much longer they had to be on the iPads. The novelty in the beginning of using the iPads and the excitement of using them had dissipated by the sixth session. Not all of the students were disengaged, but enough to shift the scores. These results are in direct conflict with the results Crombie posted in her research on students' perceptions of using iPads in foreign language learning classrooms (Crombie, 2013).

#### Table 3

Observation Template- Engagement Results- Group Traditional

				T	raditiona	l Group- H	Engageme	nt			
Class #	1	2	3	4	5	6	7	8	9	10	
Repeats all required vocabulary											
Repetitions	Pretest	2	2	2	2	2	2	2	2	Posttest	16
Accepts pronunciation corrections by											
repeating with better pronunciation	Pretest	2	2	2	2	2	2	2	2	Posttest	16
On task	Pretest	2	2	2	2	2	2	1	1	Posttest	14
Participates fully	Pretest	0	0	0	0	2	2	1	1	Posttest	6
Responds correctly in game	Pretest	0	0	0	2	1	1	1	1	Posttest	6
Distracted	Pretest	2	2	2	2	2	2	1	1	Posttest	14
Bored	Pretest	2	2	2	2	2	2	2	2	Posttest	16
Confused	Pretest	2	2	2	2	2	2	2	2	Posttest	16
Cooperates with others	Pretest	1	1	1	1	2	2	1	1	Posttest	10
		13	13	13	15	17	17	13	13		114

Table 3 shows the results of the Traditional Group's engagement in each class and overall. Out of total possible points of 144, the Traditional Group scored 114 points. There was no significant drop of in engagement toward the end of the classes.

## Figure: 2 Observation Template- Engagement Results Comparison



Figure 2 visually represents the significant difference in each group's engagement. Overall, the Traditional Group displayed significantly higher engagement scores over the Lingo Group. As would be expected, the Traditional Group's classes were more engaging and collaborative and embraced the constructionist ideal of collaborative learning while the Group Lingo was extremely individualistic and in no way relied on collaborative working and learning. One can deduce that the Lingo Group's perceptions based on their levels of engagement were negative, especially as the sessions continued. The negative perceptions increased with the number of hours spent using the app



## Figure: 3

### Emergent Themes from Observation Journal

Theme	Lingo	Traditional
Doesn't follow directions/instructions	N, N	B, Z, G, G
Distracted or Distracting	N, N	B, G, G, Z, E
Not on task	N, V, N, V, N	B, G, G, G, E
Bored	$\checkmark$	
Absent	W	E, D
Will not participate		В
Anxiety	V, V, N, V	
Excited	✓	$\checkmark\checkmark\checkmark$
Engaged	$\checkmark$	$\checkmark\checkmark\checkmark$
Frustrated	V, N, V, ✓, V	
Defiant/Non-compliant	N, N	
"\" roprosents entire class I atter	roprosents student alies	

Figure 3 represents themes that emerged from the observation journal kept for each class during this study. Each letter represents the student alias. On 11 occasions, Student N in the Lingo Group consistently demonstrated negative engagement behaviors including not following directions, getting distracted or distracting others, not on task, exhibiting anxiety, frustrated and defiant/non-compliant. The following journal entry in Appendix B explained: "N not on task. Distracting other students with inappropriate questions. Does not participate in the group. Prefers to distract and gain their attention. Difficult and time consuming to return the students' attention.". All positive methods of discipline were incorporated with Student N who sometimes responded to the positive discipline and at other times did not care and did not respond positively. Student N's overall results paralleled his engagement scores. He scored in the lowest percentile on the posttest.

Student V experienced a tremendous amount of anxiety during the classes. This student was terrified of getting an answer wrong as noted in the following journal entry from class #2-3:

"V: Crying/sobbing b/c he was getting wrong answers. Would not play b/c he didn't want to get any answers wrong. I explained that this is how we often learn, by making mistakes. He responded, "It's too hard. It's too hard." He continued to sob and refused to play. I told him to return to the "review" segment and play the games sections when he felt more comfortable. He liked that idea and played on the flashcard/rote segment for the entire period. He does not like to take risks and is terrified of being wrong in everything we do, not just this game. It could have been classroom bingo or duck duck goose and he would react the same way. If he isn't 100% sure an answer is right he won't play."

The instructor used several methods to calm the anxiety and get this student engaged. She explained to him that in this app we learn through making mistakes. This seemed to make him more anxious so she advised him to review the vocabulary in the first segment of the app before attempting the games. She showed him how he could stay on the flashcard segment of the app until he was comfortable to move on. Once he realized this was an option he calmed down and was content to simply review the flash cards for the entire class on the app.

Student V's scores were not reflective of his engagement scores. He did play on the app, but he never left the review/flashcard section of the app. Consequently, he did not finish the two levels on Lingo Arcade. Regardless, he had the second highest overall score on the posttest. This is attributed to the student's overall academic prowess.

As a whole, the Lingo group received more negative behaviors of engagement than the Traditional Group. They received a check mark ( $\checkmark$ ) on two occasions for displaying boredom and frustration. Conversely, the group received two check marks ( $\checkmark$ 's) for being excited and engaged. This occurred during the fourth class when all of the students had achieved trophies for all of the vocabulary words in the first level of play. They were all quite excited and became motivated to play more after receiving their trophies and attaining the second level. These results were in line with Crombie's research on students' perceptions using iPads in the foreign language classroom (Crombie, 2013). The students most likely in her study were not saturated with their use. As time went on, the Lingo Group's perceptions became more negative. Overall, Group Lingo received two positive checks as a whole and two negative checks. The Traditional Group received six positive checkmarks and no negative checkmarks. On an individual student basis, there were 19 occasions when students were specifically identified as displaying negative engagement behavior. This phenomenon parallels the pretest – posttest differentials. In the Visual – Spanish segment, the pretest – posttest differentials were significantly lower in the Lingo group than the Traditional Group, as were the overall word pretest – posttest improvement scores. Although this group ended up in the same place as the Traditional Group, their percent improvement plateaued. This is a direct result of their lack of positive engagement as a whole.

The Traditional Group as a whole demonstrated many more instances of positive behaviors. There were six instances when the instructor gave the entire class marks for being excited and engaged. Student G displayed seven instances of negative engagement. Student B exhibited four instances of negative engagement, but that was early on. Once she understood what was expected in the unit, she was much more responsive and engaged (Appendix B). Student G, although exhibited negative engagement, was extremely positive and good natured about learning the new vocabulary. His issue was getting overly excited, not following the directions and distracting others during the games. He wanted to learn. It was just difficult for him to focus on the instructions. The following journal entry explains the nature of this behavior:

"The memory game was challenging for Traditional Group 1 because Z and G would not follow the directions. They were more interested in the competition than following the instructions of flipping the card over slowly and allowing all of the players to see the card as they repeated Spanish name for the picture. The game got so competitive they just wanted to match the cards instead of integrating the verbal aspects of the game. It took a lot of supervision to insure they followed the procedures. I needed to balance their excitement of the game, because they loved the game and I didn't want to squash their spirit, but if they didn't incorporate the verbal aspect of the game, the activity would be in vain. It's a fine balance."

#### **Answers to the Research Questions**

The quantitative data and qualitative answer the original research questions:

- 1. What is the impact of adding the Spanish vocabulary app, Lingo Arcade, on first grade student's Spanish vocabulary acquisition at XYZ school?
- 2. What are the first grade learners' perceptions of integrating the Lingo Arcade app into the Global Learning Lab?

The data revealed that Lingo Arcade did not have as significant of an impact on the first grade students' vocabulary acquisition as the group that exclusively used traditional foreign language vocabulary acquisition methods. In fact, the students who relied solely on traditional methods for vocabulary acquisition showed greater gains than the group who only used Lingo Arcade. In general, using Lingo Arcade significantly improved pretest – posttest scores on the two levels of foreign language vocabulary proficiency, but the Lingo Arcade improvements were less than the improvements made by the Traditional Group.

The second question regarding the first grade learners' perceptions of integrating the Lingo Arcade app were measured by levels of engagement during the instruction. Observations showed that the first graders in the Lingo Group were significantly less engaged and interested during instruction compared to the Traditional Group. This signifies that the students' perceptions, as a whole, were negative toward the use of the iPad app for part of the time. Not all of the students were disengaged all of the time, but the majority of the students in the class experienced boredom, distraction and/or confusion at least part of the time on the iPads. Their negative perceptions were directly proportional to the time spent on the iPads. The longer the students spent on the iPads, the more negative their impressions of the game became.

## DISCUSSION AND CONCLUSION

## Overview

This study investigated the integration of Lingo Arcade, a foreign language vocabulary learning app, into the instructional unit of one group and the integration of traditional foreign language vocabulary learning methods into the same instructional unit of the second group. Each method was integrated into a typical GLL instructional unit and followed the GLL class format. Both groups consisted of first graders at XYZ school. The results showed that the group exclusively using Lingo Arcade showed significant improvements in their Spanish vocabulary repertoire; however their engagement levels dropped with the longer use of the Lingo Arcade app. Students became disinterested and bored. Additionally, the investigation discovered that the integration of traditional methods of learning foreign language vocabulary, such as flash cards and group games including memory, snap, "Around the World" and "Jeopardy" made a greater impact in the students' Spanish vocabulary learning than the group that exclusively used Lingo Arcade. Also, the engagement scores within the Traditional Group were significantly higher than those of the Lingo Group.

These conclusions are not conveying that Lingo Arcade was ineffective. It was very effective, simply not as effective as the traditional methods. Overall, Lingo Arcade is engaging and has educational value. Each group boasted the exact same posttest score after the instructional units were completed. Both methods should be incorporated into the classroom, but the instructor should gingerly use the Lingo Arcade app and be careful not to over-use it. It will not replace traditional instruction. Lingo Arcade should be used in the following situations:

- An add-on to traditional vocabulary teaching methods
- A tool for substitutes who don't speak the foreign language
- Extra class time
- When students finish work and are waiting for other students to finish
- A gap between instruction

Lingo Arcade should not be used exclusively to instruct foreign language vocabulary. This study provided significant evidence demonstrating that living the language just as Krashen noted in his research is the best way to learn foreign language vocabulary (Krashen, 1983). Living the language is the most natural and effective way to acquire language. Lingo Arcade can be a *part* of the learning process, but not all of it.

## **Problem Solutions**

The use of either method, Lingo Arcade or the Traditional Method of foreign language vocabulary learning, will benefit the Global Learning Lab's issue of time. Time needs to be maximized so students can build upon their current Spanish vocabulary, but still experience other languages and cultures without losing their Spanish capacity and building upon their Spanish foundations. Both Lingo Arcade and the Traditional Methods are effective means of teaching foreign language vocabulary and offer the student ample review of the words. Even though both methods produce significant benefits, the traditional method of teaching foreign language vocabulary has a greater impact than the Lingo Arcade. The global learning lab should use a variety of methods to deliver vocabulary instruction with an emphasis on the collective, group learning environment as endorsed by the Constructivist model. The global learning lab should offer a balance of learning opportunities which include all three learning styles of visual, auditory and tactile. Lingo Arcade offers all three of these styles, however, it is in an individualistic format.

The global learning lab could incorporate the Lingo Arcade app into a Constructivist, classroom learning activity by having the students play the app together at the front of the room on a screen divided by two teams, or the app could be played in small groups. This would promote more collective learning among the students.

In order for the Global Learning Lab to maximize time, it should use the Lingo Arcade app and similar apps when students finish activities or classwork early. The app could also be used in differentiated instruction to keep all students on par with the learning objectives. Students in their homerooms could also take advantage of extra class time by signing onto the Lingo Arcade app. If a student finishes a project, activity, test, reading or whatever it is, s/he can spend the little bit of extra time on Lingo Arcade instead of coloring, reading or whatever activity is given. At the very least, it could be an option for them to improve their skills.

Strengths and Weaknesses

## Table 4Mean Deviation Pretest-Posttest Scores

	Mean l	Deviatior	1									
Lingo	-0.34	0.35	0.00	-0.42	0.06	-0.23	0.49	0.27	0.20	-0.27	-0.11	
Traditional	0.09	-0.80	0.29	-0.10	-0.10	0.02	0.20	0.26	0.20	-0.34	0.28	0.01

## Table 5

t-Test Data

t-Test Data					
	Mean	SD	SEM	Ν	
Lingo	0.4818	1.01454	0.0438	11	
Trad	0.6433	0.1983	0.0572	12	





In Figure 4, the unpaired *t* Test results show that the two-tailed *P* value equals 0.0384. By convention, this difference is considered to be statistically significant. To obtain the confidence interval, the mean of the Traditional Group is subtracted from the mean of the Lingo Group. That difference was -0.1615. There is a 95% confidence interval of this difference from -0.3135 to -0.0095.

The intermediate values used in calculations were:

- *t* = 2.0896
- df = 21
- standard error of difference = 0.073



#### **Further Investigation**

This investigation demonstrated that using Lingo Arcade app in the foreign language classroom positively impacts foreign language vocabulary learning. However, the impact of Lingo Arcade is not as vigorous as using Traditional foreign language vocabulary learning methods. Now that we know this app does have a positive influence, however, it would be interesting to find out if a traditional foreign language classroom *adding* Lingo Arcade to traditional instruction would have a more significant impact than not incorporating it into the instructional unit. In other words, instead of looking at it on its own, it would be interesting to see what synergy potentially exists between combining it with traditional instruction.

It would also be curious to know the number of repetitions a student gets from using the Lingo Arcade app versus the number of repetitions s/he receives in a traditional foreign language classroom. It would be interesting to know the impact of these repetitions in learning and retaining the foreign language vocabulary. In the same light, a study that examined the retention of vocabulary would be interesting. It would be productive to know if a student retains the vocabulary after a period of time and compare it to each instructional method.

Students with special needs could benefit from this type of study. It would be helpful to them if a study was done on the effectiveness of this or other apps within populations of students with dyslexia or Asperger's. These students are often excluded from foreign language classrooms. Could an app like Lingo Arcade assist them in learning a foreign language and help differentiate instruction?

Finally, this study would be a great springboard to a generalizable study. Research of this nature would be significant to all foreign language instructors in their development of curriculum and lessons. It would help them understand how much of the technology should be integrated with an understanding of saturation points. In other words, what is the point in which the student becomes bored with the app? Are there other apps that could dissipate this monotony? Which language apps have the most educational value?

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# Educational Tourism: Valuation and Conservation of the Natural Resources in Chilla and Pasaje

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#### ABSTRACT

This work is based on educational contributions from the tourism perspective and the natural resources conservation. The academy is the fundamental part to discuss Educational Tourism since all the related activities are part of the teaching-learning processes that transmits traditions, customs and the natural resources valuation of a specific region. The study was conducted in the districts of Chilla and Pasaje in the Oro Province. This is a descriptive analytic no experimental research with a mixed methodology. A survey was applied to 401 participants randomly chosen from two districts. The V of Crammer established the effect magnitude and/or the dependency strength, and the OR recognized the risk factor and the Ch2 for the validation of the null hypothesis. The results indicate that there is a direct relationship between the survey respondent instruction levels versus the natural resources valuation. It was revealed that in the secondary level the average 88,8% of moderate importance to low resulted extremely high against 11,20% of medium to high importance. Similar studies concluded that the Educational Tourism model can ease this low valuation since the students function in an environment that allows them to understand how the ecosystem operates.

Keywords: educational tourism, natural resources, conservation, learning

### INTRODUCTION

The tourism industry grows fast and has a close relationship with the development and competitiveness of the countries. It is a generated source of direct and indirect employment and it is linked with different economic, social and cultural sectors. It also represents the voluntary journey and free time enjoyment in recreational and relaxing activities.

The present study was based on the educational contributions of the tourist field and the conservation of the natural resources. From the academic point of view, it is important to recognize that the key idea of the Educational Tourism is to link the activities with the teaching-learning processes and to help transmit traditions, costumes and the valuations of the natural resources of a specific area. In this sense, Alcántara Boza (2010) maintains that the link between education and the terrestrial space has been scarce and for this reason, there is an inadequate use of natural resources, consequently, there is a valuation need of them. The particularity in the Educational Tourism Development is shown in its cross-functionality since it incorporates educators specifically related to the environment. Furthermore, it allows the development of natural resources conservation activities and manages programs that are socially and environmentally related (Bonilla, 2011). According to Silva (2013), Educational Tourism is an extensive and interesting issue that allows developing the culture and the potential of

tourism in an area based on own and unaware experiences and includes educational tourism products, programs of formal and informal education for the tourism sector and educational activities in tourism. It is important to mention that natural resources according to Morrello (2000) are the goods and services that the human beings find available in nature and serve to satisfy men needs. Similarly, a resource is related to the elements that represent the richness of a country which is removed by individuals to obtain benefits and meet their needs (Sánchez y Gándara, 2011; Chediack, 2009).

Just as human beings needs and the societies in which they function have been changing, the natural resources have been exploiting in different ways and intensities. The current society demands and consumes each day more and more natural resources for subsistence. The uncontrollable demographic expansion is causing an accelerated damage of natural resources; the actions taken for the environmental conservation are considered limited and with low results due to the population's lack of consciousness from the areas of Chilla and Pasaje. The educational institutions should raise awareness to the population about natural resources and its conservation, that all the ecological systems develop its own regeneration processes and that many times men due to lack of knowledge interrupt that dynamic, causing instability and the majority of times the loss of this regeneration (Batlori Guerrero, 2005). According to Neiman, Barbosa and Pereira (2012) environment Education proposes to improve the relation human-nature by having a much broader perspective than the formal and informal education of schools. In other words, it must be cross-disciplinary and act in this way. Educational tourism must act to rescue values that formal education has forgotten through activities that generate contact with nature, life experiences and learn to value and conserve the natural resources. For this reason, Carvalho (2004) considers necessary to have a dynamic with realistic scenarios that stimulate knowledge of different areas and new learning spheres. Dealing with teaching-learning processes, Rogers's pedagogy contemplates that the relationship between student and teacher must center on the self-discovery, this means that on his own the student generates knowledge using abilities, feelings and experiences that guaranty the permanent self-learning (Casanova, 1989). In this sense, Puig (2007) indicates that the educational system is concerned on teaching, but not on learning, and consequently students function in an authoritative educational model.

#### THE STUDY

The aim of this study is to find relevant data that leads to taking decisions in relation to the valuation and conservation of the natural resources in Chilla and Pasaje located in El Oro Province in Ecuador. For this purpose, it is applied an Analytic descriptive no experimental research, with a mixed methodology. A survey was applied to 401 participants randomly chosen from the two districts. The IBM SPSS Statistics 23 data analysis tool is used to analyze the data and validate the research questions raised at the beginning with a 95% confidence interval. With a universe of 85,559 habitants according to projection 2016 census, the formula of Pita Fernández is applied to the calculation of the sample.It is also applied the Frequency Statistics, Pearson Chi-square test and P-value to establish the statistical significance, then the V of Crammer to establish the effect magnitude and/or the dependency strength, and the Odds Ratio (OR) to establish if the dependent and independent variables were risk factors, protective or indifferent. It was necessary to transform the variables polytomic dichotomousto be able to determine the existing relationship. It was determined from the obtained answers in the tabulation the adding and later the calculation of the cut points that will allow us to codify the transformed answers. To determine the relationship between the variables, it was used besides the Chi2, the value of "p", which allows accepting or denying the potential hypothesis or research question.

#### RESULTS

As it is observed in figure (1) the CrossTab between the importance range and the level of instruction of the survey respondent indicate high percentages in the moderate range of importance to low percentages in the importance range from medium to high. In the level of elementary instruction, the moderate to low importance has a 79, 5 % and the median to high importance has a 20 %. In the technical level, there is an 84, 2 from moderate to low and a 15, 8% from median to high. The undergraduate level presents a 71, 7% from moderate to low and a 28, 3% from median to high.



		RANGE OF IMPORTANCE R	RRNN WITH CUT POINT	Total
		FROM LOW TO	FROM MIDDLE TO	
		MODERATE	HIGH IMPORTANCE	
		IMPORTANCE		
INSTRUCTION	Primary	79.5%	20.5%	100.0%
LEVEL	Secondary	88.8%	11.2%	100.0%
	Technical	84.2%	15.8%	100,0%
	Undergraduate	71.7%	28.3%	100.0%
	Postgraduate	100.0%		100.0%
	None	100.0%		100,0%
Total		85.0%	15.0%	100.0%

#### Table 1 CrossTabs: Natural Resources and instruction level

Source: survey

Elaborated by the authors

We focus in the most relevant data: in the case of the secondary instruction level, the average is 88, 8% of the importance range from moderate to low which is extremely high compared to 11, 20% which is the range of middle and high importance. (Table 1, illustration 1)



Graphics 1 Level of instruction vs. Importance of Natural Resources

Source: Survey Elaborated by: Authors, SPSS

The results indicate that there is a direct relationship between the survey respondent's level of instruction versus the natural resources' valuation.

As it was mentioned in the previous paragraphs, it was applied the Pearson's Chi-squared test. The data were processed with a 95% interval of confidence. In the next table according to the results, we can infer that there is a relationship between two variables: instruction level and valuation of the natural resources. The significance value is 0,006 considered less than 0, 5.

	Value	Df	Asymp	Sig. M	lonte Carlo (	2-sided)	Sig. Mo	onte Carlo	(1-sided)
			Sig.	Exact Sig.	Interval	confidence	Sig.	Inte	rval
			(2-	(2-sided)	9	5%		confiden	ce 95%
			sided)		Lower	Upper		Lower	Upper
Pearson Chi-	16,523 <sup>a</sup>	5	,006	,000 <sup>b</sup>	,000	,007			
squared									
Likelihood ratio	19,137	5	,002	,000 <sup>b</sup>	,000	,007			
Fisher exact test	15,388			,002 <sup>b</sup>	,000	,007			
Linear by linear	,327 <sup>°</sup>	1	,567	,566 <sup>b</sup>	,518	,615	,314 <sup>b</sup>	,269	,360
association									
N valid cases	401								
a. 3rd square (25,0%) has expected a re-counting less than 5. The minimum re-counting is,90.									
b. It is based on 401	b. It is based on 401 sample tables with an initial seed of 110194448.								

#### Table 2 Pearson's Chi-squared test

c. The standardized statistic is -,572.

Source: Survey

Elaborated by the Authors

Table 3 corresponds to the application of Phi and Cramer's V. The data is similar to Table 2 which keeps the tendency of the statistical significance between the variables of instruction level and the natural resources valuation, similarly, it has been considered a confidence interval of 95%, phi 0,006 and Cramer's V 0,006. Table 3 Symmetric Measures

		Value	Approx.		Sig. Monte C	Carlo
			Sig.	Sig.	Confidence I	nterval 95%
					Lower	Upper
Nominal by	Phi	,203	,006	,000°	,000	,007
Nominal	Cramer's V	,203	,006	,000°	,000	,007
N valid cases		401				

c. It is based on 401 sample tables with an initial seed of 110194448.

Source: Survey

Elaborated by the authors

#### CONCLUSIONS

The results indicate that there is a direct relationship between the levels of instruction of the survey respondent versus the natural resources valuation. In theory people with this instruction level value natural resources with more intensity, but this does not happen.

Other studies of this type conclude that the educational tourism modality can ease this low valuation since the learning level is higher, being a different experience and completely out of the routine, the student functions in an environment that allows him to understand how an ecosystem works.

A study conducted by Pitman, Broomhall, Majocha, & McEwan (2010) found that educational tourism is characterized by intentional and structured learning experiences that provide opportunities for the teacher to go in depth in experiences that have the potential to challenge beliefs and bias previously sustained. Furthermore, the typical educational tourist is a student well educated and critical, and therefore the challenges the teacher in ways that cannot happen in the classroom.

In general, there is a great potential for the educational tourism to create learning, transforming experiences for professionals who organize trips and use them as a different classroom.

In almost all the manifestations of educational tourism, it is important to determine that the objective to follow is education. In this way it can be included learning about a specific topic and also values of social harmony, respect, and teamwork; consequently, if the trip objective is an education in all its forms, tourism is the method. It is a very singular and attractive way to obtain educational objectives effectively. However, Llonch (2012) considers the following recommendations:

1) The educational tourism and/or schooling must be the base from which we teach children, adolescents and youth to behave, relate, observe and deduce.

2) It must always have a clear educational objective that in our case will be to value the natural resources for its conservation.

3) It must be clear that educational tourism is an important and irreplaceable method, but it is not the objective of the educator.

4) The ones who organize or are intermediaries of the educational tourism must know the objectives of these trips. In other words, they need to be specialized.

5) The educational tourism must be conceived as an additional activity of the world discovery.

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## Effect of Teaching Positive Parenting Program to Mothers on Reducing Behavioral Problems in Children with Oppositional Defiant Disorder

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### ABSTRACT

Positive Parenting Program (Triple-P) is one of the most significant methods to treat mental disorders and behavioral problems in children and adolescences. This study was conducted to examine effect of teaching triple-p to mothers on reducing behavioral problems in children suffering from oppositional defiant disorder (ODD). this is a quasi-experimental study with pretest-posttest plan and consisting of control group. Statistical population of study consists of all mothers who have children at age range of 5-11 with ODD referring to counseling and psychotherapy centers of Bandar Abbas, Iran during 2015. Of those who had inclusion criteria, 30 members were selected randomly and assigned to two experimental and control groups. Comprehensive Behavior Rating Scale-Parent Assessment Report (Conners CBRS–P) and Eberge's Children Behavior Questionnaire were filled out at baseline and after intervention; the obtained data were analyzed using ANCOVA and Independent t Test through SPSS22 Software. results showed that teaching triple-p to mothers could effect on reducing behavioral problems at posttest step. According to comparison between means controlling their pretest scores, children of mothers who had received triple-p (experimental group) significantly obtained lower scores in behavioral problems questionnaires at posttest step compared with control group members ( $P \le 0.01$ ). findings implied that teaching positive parenting program to mothers led to reduced behavioral problems in children with oppositional defiant disorder.

#### INTRODUCTION

ODD is a pattern of hostile, disobedient, and defiant behaviors directing at adults or other authority figures (Barkley, 2009). ODD is also one of the most common clinical disorders among children and adolescences (Steiner &Remsing, 2012). This disorder is categorized as disruptive behaviors that are the most important disorders referring to children mental health clinics (Costin et al., 2011). Various factors such as age and gender are related to this disorder and about half of children population that are diagnosed with ODD are indeed suffering from another types of psychological disorders (Helfinger Humphreys, 2008) so that its prevalence among pre-school children has been estimated to 4-16% (Ager &Angold, 2006). This disorder usually occurs between age of 8 and 12 and is more common between boys compared to girls (Nock et al., 2009).



Therapeutic treatments for children were often concentrated on children in past while there have been a high tendency toward treating behavioral problems of children using parents' participation recently (Urquiza&Timmer, 2012). According to conducted studies in this field, intimate and supportive relationships in family are predictors of positive adaption of children and adolescences as well as protective factors for behavioral problems among youth (Sanders & Wooly, 2005). Behavioral interventions in family that are based on social learning principles are the most strongest types of interventions to help children who suffer from behavioral and mood problems (Turner & Sanders, 2006). Antecedents indicate that parents; behavioral training programs are the firs preventive strategies to treat children with behavioral problems and this strategy is increasingly used (Self-Brown, 2011).

Triple-P is a kind of family behavioral interventions that is designed based on social learning principles; it is also recognized as one the strongest interventions to help children suffering from mood and behavioral problems (Sanders, 1999). The objective of this program is proper use of expert people to increase competency of parents and improve these teachings at a wide scale of society. This program is presented at 5 different levels based on the dysfunction of child and family as well as their various needs. Triple-P-based interventions in different populations have led to reduced disruptive behaviors among children (Sanders, 1999).

According to the studies conducted on effect of this training method in groups, these interventions have led to significant reduction in behavioral problems in children (Turner & Sanders, 2006). Whittingham (2014) conducted a study and showed that teaching triple-p to parents could reduce behavioral disorders in children with autism. In addition, Au (2014) conducted an experimental study to examine effectiveness of triple-p-base group therapy in Chinese mothers of children with Attention Deficit Hyperactivity Disorder (ADHD). Results showed that triple-p could effect on reducing behavioral problems in children and increasing self-efficacy of mothers; this achievement continued within a 3-months follow-up.

Mohareri et al. (2012) conducted a study entitled effect of teaching triple-p to mother on improving relationships with teenagers; they found that educational interventions of positive parenting could improve parenting methods, increase their competency, improve relationships between parents and children, and reduce children's behavioral problems. Another study was conducted by Azemnia and Ghahari (2016) on children suffering from ADHD and results showed that teaching behavioral strategies to mothers could reduce anxiety symptoms and mood problems in such children. Since teaching triple-p to parents in an important parameter to prevent from behavioral problems and treat children with such problems, this study was conducted to examine effect of teaching triple-p to mothers on reducing behavioral problems in children with ODD.

#### METHODOLOGY

This is a quasi-experimental study that was conducted with pretest-posttest plan and control group. Statistical population consisted of mothers of children at age range of 5-11 suffering from ODD and referring to counseling and psychotherapy centers in Bandar Abbas, Iran during summer 20152 centers were selected randomly within sampling process from counseling and psychotherapy centers in Bandar Abbas then those mothers whose children were diagnosed with ODD based on psychologist diagnosis, statistical and diagnostic guideline criteria a of mental disorders version DSM-V were selected as sample members. There were 43 mothers that 30 members of them were elected randomly and assigned to experimental (15 members) and control (15 members) groups. All participants signed the consent before intervention. Mothers in experimental group were trained within 8 sessions and control group remained in waiting list. The data obtained from baseline were analyzed after treating with statistical method of ANCOVA and Independent t test through SPSS22 Software.



#### **Content of Training Package**

Triple-P training package- parent version was used in this research. Triple-P was designed by Sanders et al. (2005) in University of Queensland in Australia and its implementation license was obtained based on the contract between Cognitive Science University, Iran Psychiatry Association for Children and Adolescence, and mentioned university in Australia (Tehranidoost et al. 2008). This program is presented at 5 levels that a level of it is allocated to group training of parents to strengthen parenting skills. This training program is hold through 2-houres 8 sessions. This program is based on the social learning model of parent-child interaction determining bilateral nature of parent-child interactions. The content of triple-p sessions was as follows:

Session 1 (group positive parenting): participants became familiar with each other and the content and objectives of the program in this session; group rules were discussed and reasons for behavioral problems were explained to mothers. In addition, mothers were encouraged to follow and monitor behavior of their children and ascertain some goals to change their behaviors.

**Session 2 (Child growth promotion 1):** some strategies are taught in this session to create positive relationships with children such as talking to child, having emotional kind relationship, and spending time with child then parent were asked to play such roles in small groups.

Session 3 (Child growth promotion 2): some strategies were taught to parents in order to increase positive behaviors such as descriptive admiration, and preparing amazing activities, etc. in this regard, parents are taught when and how use these teachings.

**Session 4 (Child growth promotion 3):**some strategies such as accidental training, questioning technic, responding, doing, etc. to parents in this session in order to teach child new behaviors and skills.

Session 5 (Inefficient Behavior Management 1): some negative implications of punishment were explained to mothers in this session and then some strategies were taught to cope with inefficient behaviors of child. The mentioned methods consisted of setting rules, direct negotiation, direct and explicit order, and ignoring.

**Session 6 (Inefficient Behavior Management 2):** punishment isreplaced with some strategies at this step using some advanced methods such as logical implication, depriving and silence time to cope with inappropriate behaviors of children.

Session 7 (Inefficient Behavior Management 3): since the introduced methods in previous sessions are not enough, they should be combined with each other. Three applied programs including daily program of obedience, behavior correction program and behavioral chart were taught to parents to manage inefficient behaviors of their children.

**Session 8 (Preplanning):** parents were taught in this session to identify risky situations and introduced methods in previous sessions in framework of planned activities within risky situations inside and outside of home. Some instructions were proposed to mothers to create comfort in family.

#### INSTRUMENT

**Eberge's Children Behavior Questionnaire**: this instrument was made by Eberge and Pinkas (1999). This questionnaire evaluates behavioral problems, disobedience, and mood problems in home. There are 36 questions in this questionnaire and examine two subscales of intensity and problem among children and adolescences at age range of 6-12. Scoring method was based on two scales; one scale is intensity that indicates frequency of considered behaviors of child and the other scale evaluates the problem whether parents consider that behavior as a problem in child or not. Each item of questionnaire was scored at Likert scale from 1 (never) to 5 (always) that total score indicates scale score. Correlation between scores of ECBI and total score of child behavioral checklist (CBCL) was significant and indicated validity of questionnaire. In addition, differential validity of ECBI was successful to distinguish normal groups from groups with mood disorder. Internal consistency obtained to 0.88 using Cronbach'salphs. Retest rate of intensity obtained to 0.86 within 3 weeks and to 0.88 for problem subscale (Eberge&Pinkas, 1999). A study was conducted by Haji SeyyedRazi et al. (2012) in which, alpha coefficient obtained to 0.93 and 0.92 for intensity and problem, respectively; moreover, questionnaire retest rate obtained to 0.74 and 0.58 for intensity and problem, respectively.



#### RESULTS

Education level of mothers, age of mother and child in two experimental and control groups are described in table 1. According to table 1, mean of mothers' age in control group and experimental group was 34.27 and 35.47, respectively. In addition, mean of children's age in control and experimental groups was 6.34 and 6.05, respectively. Majority of participants had diploma degree.

Table 1. Mean and standard deviation	n of mother age and chi	ild age in control and ex	perimental groups
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	(	Group		
Experimental		Co	Variable	
(SD)	Mean (M)	(SD)	Mean $(M)$	
6.28	35.47	9.38	34.27	mother's age
1.59	6.05	1.96	6.34	child's age

#### Table 2. Frequency and percent of education level of mothers in control and experimental groups

Ex	perimental	C	Variable	
Percent	Frequency	Percent	Frequenc	
			У	
26.7	4	20	3	Elementary
20	3	13.3	2	Secondary
33.3	5	46.7	7	Diploma
20	3	20	3	BA
100	15	100	15	Total

Following tables show mean and standard deviation of variables scores obtained by two experimental and control groups.

Group					
Exp	Experimental		Control		Variable
SD	Mean	SD	Mean		
17.89	134.40	21.33	134.93	retest	Behavioral
14.99	128.87	16.98	136.27	posttest	(mood)problems

According to table 3, there are differences between scores obtained by experimental group within pretest and posttest steps.

Main Hypothesis: "Triple-P training for mother can effect on reduction in behavioral problems in children with ODD".

Table 4. Results of ANCOVA for effect of group membership on penavioral-mood problems at po
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significance	F	mean squares	df	sum of squares	changes	step	Variables
(P)					source		
0.001	241.16	6461.27	1	6461.27	pretest	posttest	Behavioral-
0.001	13.37	366.21	1	366.21	groups		mood
		26.79	27	723.39	error		problems

According to table 4, teaching triple-p to mother can effect on reducing behavioral problems and oppositional defiant at posttest (F(1,27)=13.37,P $\le$  0.01). The obtained means (M=128.97) show that mothers who received triple-p in experimental group based on controlling pretest scores of behavioral-mood problems had significant lower scores at posttest step compared to mothers who did not receive triple-p in test group (M=136.27) (P $\le$ 0.01).



#### DISCUSSION AND CONCLUSION

This study was conducted to examine effect of teaching triple-p to mothers on reducing behavioral problems in children suffering from ODD and the obtained results showed effectiveness of teaching triple-p to mothers on reducing behavioral problems in children with ODD. This finding is in line with results study conducted by Sanders et al. (2012) that examined effectiveness of triple-p on parents with 2-7 years old children with ODD. This study showed that mothers who had received triple-p obtained good scores in scales of children behavioral problems, inefficient parenting styles, trust of parents in their own parental role and parents' anger; it should be mentioned that these results were fixed after 6-months follow-up and increased performance was observed in some cases. Results of present study are matched with findings obtained by Islami et al. (2012) that conducted a study to examine effect of training package of positive parenting on improving parenting styles, reducing behavioral problems in adolescences and improving their relationships with their parents. Results obtained in mentioned study indicated that training interventions of positive parenting could improve parenting styles, increase competency of parents, improve relationships between parents and adolescences, and decrease their behavioral problems. Results obtained in present study are also in line with findings of following studies: Mohareriet al. (2010) that conducted a study entitled "effect of teaching triple-p to mothers on improving relationships with adolescences" and concluded that training interventions of positive parenting could improve parental methods, increase parents' competency, improve relationships between parents and adolescences and reduce their behavioral problems; the study of Khodabakhshi (2012) conducted on effect of teaching triple-p on pre-school children with ADHD so that 22 mothers received interventions and results showed a significant reduction in behavioral problems of children; studies conducted by Whittingham et al. (2014) concluding that teaching triple-p to parents can reduce behavioral disorders in children with autism; study of Au et al. (2014) that examined triple-p-based group therapy for mothers of children with ADHD and indicated after 3-months follow up that triple-p could effectively reduce behavioral problems and increase self-efficacy of mothers.

**CONCLUSION:** it is possible to reduce anxiety and mood behaviors in children with ODD and Hyperactivity disorder through teaching triple-p to their mothers.

ACKNOWLEDGEMENT: we appreciate all mothers who participated in this research.

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## Effect of the use of Instructional Resources on Students' Performance in Electricity and Magnetism

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#### ABSTRACT

The purpose of this study was to investigate the effectiveness of the use of instructional resources on the academic performance of students and also how these materials can motivate learners to learn Physics. The study was a quasi- experimental research design that employed pre-test, post-test, interview and observational technique. The population of the study comprised all Senior High School science students in the Nkwanta South District of the Volta Region of Ghana. Purposive and convenience sampling techniques were employed to select the sample for the study. Form three (3B) science class which consisted of thirty-seven (37) boys and three (3) girls was selected for the study. The total sample for the study was forty (40) form three (3B) science students of Nkwanta SHS (37 boys and three 3 girls). The data obtained was analysed using SPSS to find achievement mean scores. To see the treatment effect, the mean scores were computed to determine the average achievement on the variable of the pre-test and post-test. In addition, the significance difference between the mean scores was tested at 0.05 level by applying t-test based on the pre-test and the post-test. It was observed that the mean score of the post-intervention test (Mean = 16.70, Sd = 1.977) is much higher than the mean score of the preintervention test (Mean = 7.22, Sd = 3.068). Hence, statistically there was a significance difference between the performance of students when taught with instructional materials and when not taught with instructional materials. It was recommended that stakeholders should ensure regular provision of instructional materials to the SHSs to enhance teaching and learning of Physics.

Keywords: Instructional resources, academic performance, effectiveness, Ghana

#### INTRODUCTION

Science as an agent of development plays an important role in bringing about changes through technological advancement, national wealth enhancement, health improvement and industrialization (Validya, 2003). This is why scientific and technological breakthrough is usually the goal of any developing nation like Ghana. Wenham (1984) opined that Physics is and will remain the fundamental science.

Despite the importance of Physics to the scientific and technological development of our nation, understanding of the subject had dwindled over the years and performance of the enrolled students had not been encouraging. Ho and Boo (2007) discussed that in many countries, there has been a decline in the number of students wishing to continue with Physics. Ogunleye (2000) and Umeh (2002) were all of the opinion that students' performances in the science subjects were poor. Also, previous study had shown that students who hold negative stereotype images of scientists, science and technology in society are easily discouraged from pursuing scientific disciplines and usually performed poorly in science subjects (Changeiywo, 2000). This situation does not favour Ghana's move towards developing a scientific and technological nation.

The influence of instructional materials in promoting students' academic performance and teaching and learning in educational development is indisputable. The teaching of Physics topics such as Electricity and Magnetism in Ghanaian secondary schools needs to be properly handled.

The materials used by teachers to teach and drive home their subject at the primary and secondary school levels of our educational system is incontrovertibly a paramount and important issue in practical classroom interaction and successful transfer of knowledge from the teacher to the students. Instructional resources are materials which assist teachers to make their lessons explicit to learners. They are also used to transmit information, ideas and notes to learners. Instructional materials include both visuals and audio-visuals such as pictures, flashcards, posters, charts, tape recorder, radio, video, television, computers, and projectors among others. These materials serve as supplement resources to the normal processes of instruction. Visual aids make lesson come alive and help students to learn better. The importance and technicality of Physics as a subject makes it necessary that relevant instructional materials should be used to teach it to the learners.

In this study, instructional resources will be used to design instructions in Electricity and Magnetism on final year SHS students in Nkwanta Senior High School after a traditional lecture approach has been used in teaching the students with the same topic. Pre-test data will be gathered and compared with the post-test data after the treatment to see the effect of the use of instructional resources on students' achievement in Electricity and Magnetism.

#### Statement of the problem

The act of teaching is fundamentally concerned with passing ideas, skills and attitude from the teacher to the learner. In Ghana, for example experience has shown that spoken words alone in the communication of ideas are grossly ineffective and inefficient in producing desired learning outcomes. Every year, when the results of public examination are released, there have always been mass failures in Physics (Chief Examiner- WAEC, 2014). The reason for this could be ascribed to the fact that there are topics in Physics that pose serious problems of comprehension to students. Most especially Electricity and Magnetism. These topics cannot be taught effectively without the use of relevant instructional materials to make the learning practical. Adebanjo (2007) affirmed that the use of instructional materials in teaching and learning of Physics makes students learn more and retain better what they have been taught and that it also promotes and sustains students' interest. It also allows the learners to discover themselves and their abilities. Students learn more when they see what they are being taught. Indeed little research work has been done on the use of instructional materials on students' academic achievement in Ghana. Poor academic achievement in Physics could be attributed to many factors among which teacher's strategy itself is considered as an important factor. This implies that the mastery of Physics concepts might not be fully achieved without the use of instructional materials. The teaching of Physics without instructional materials may certainly result in poor academic achievement. Franzer, Okebukola and Jegede (1992) stressed that a professionally qualified science teacher no matter how well trained, would not be able to put his ideas into practice if the school setting lacks the equipment and materials necessary for him or her to translate his competence into reality.

It is in this regard that makes this research pertinent. The major problem is that students' academic achievement in Electricity and Magnetism is very poor, and it is against this background that this study attempts to examine the extent to which the utilization of instructional materials could advance Senior High School students' performance in Physics.

#### Purpose of the study

The purpose of this study was to investigate whether learners will be motivated to learn when instructional materials are used during the teaching and learning process and also to examine the effectiveness of the use of instructional resources on learners' performance in some selected topics in Electricity and Magnetism during science lessons.

#### **Objectives of the study**

The objectives of this study are to:

- 1. determine whether there will be any difference in the academic performance of Nkwanta Senior High schools students in Electricity and Magnetism due to the use of instructional materials.
- 2. To find out if the use of instructional resources will motivate students to learn Electricity and Magnetism.



#### **Research Questions**

In order to achieve the objectives of this study, the following research questions were raised to guide the investigation:

- 1. To what extent will the use of instructional materials influence the academic performance of Nkwanta Senior High School students in Electricity and Magnetism?
- 2. How will the use of instructional resources motivate students to learn Electricity and Magnetism in Nkwanta Senior High School?

#### **Review of related literature**

Teaching at any level requires that the students be exposed to some form of simulation. Physics as a science subject is activity oriented (National Teachers Institute-NTI, 2007). This suggests that the mastery of Physics concepts cannot be fully achieved without the use of instructional learning materials. The teaching of Physics without learning materials will certainly result in poor performance in the course. Franzer, Okebukola and Jegede (1992) stressed that a professionally qualified science teacher no matter how well trained would be unable to put his ideas into practice if the school setting lacks the equipment and materials necessary for him or her to translate his competence into reality. This suggests that for teaching and learning of Physics to be fully materialized, there would be the need of the use of instructional resources or materials. This can be achieved through the use of computer simulations or computer assisted instructions, charts, overhead projectors, videos and properly organized practical activities.

#### **Meaning of Instructional Materials**

Instructional materials are didactic materials which are supposed to make learning and teaching possible. Instructional materials include all materials including instruments and resources that aid the teacher in realizing his/her objectives in the teaching-learning process. These include textbooks, charts, improvised workbook and so on (Ifeoma, 2013).

Instructional resource materials are all teaching assisting materials either imported or locally made that aid in teaching. They are resources which the teachers use to enhance learning, understand and facilitate the acquisition of concepts, principles and skills by students. Isola (2010) also referred to them as objects or devices, which help the teacher to make lesson much clearer to the learner. Instructional materials are also described as concrete or physical objects which provide sound, visual or both to the sense organs during teaching (Agina-Obu, 2005).Instructional materials are materials which assist teachers to make their lessons explicit to learners, they are devices which present a complete body of information and largely self-supporting rather than supplementary in teaching and learning.

#### **Importance of Instructional Resources (materials)**

Teaching is not complete until knowledge has been successfully transferred which in most cases may not just be tied to teacher effectiveness or teaching skill but the instructional materials used in the learning process (Clinton & Kohlmeyer, 2005; Cardoso, Cristiano, & Aren, 2009). According to Jimoh (2009), ordinary words or verbalization has been found to be inadequate for effective teaching. Instructional materials serve as a channel through which message, information, ideas and knowledge are disseminated more easily. They can therefore be manipulated, seen, heard, felt or talked about. These materials facilitate activities and they are anything or anybody the teacher turns to for help in learning process.

Adekunle (2008) as cited in Okobia (2011) noted that teaching resources means anything that can assist the teacher in promoting teaching and learning. When the students are given the chance to learn through more senses than one, they can learn faster and easier.



The use of instructional materials provides the teacher with interesting and compelling platforms for conveying information since they motivate learners to learn more. Furthermore the teacher is assisted in overcoming physical difficulties that could have hindered his effective presentation of a given topic. Larson (2001) quoted Lane (1994) who noted that the use of electronically mediated instruction to duplicate the traditional face to face classroom has resulted in a shift from teacher to student-centred classes. In this situation the responsibility for learning is shifted to the students. The teacher facilitates the learning by acting as a coach, resource guide and companion in learning. The use of instructional materials does not only encourage teachers and students to work collaboratively but also results in more cooperative learning activities among the students.

#### Instructional Materials and Students' Academic Achievement

There have been several studies on instructional materials and academic achievement. For instance, Adeogun (2001) and Fadeiye (2005) discovered a very strong positive significant relationship between instructional resources and academic performance. According to them, schools endowed with more materials performed better than schools that are less endowed.

Lyons (2012) states that learning is a complex activity that involves interplay of students' motivation, physical facilities, teaching resources, skills of teaching and curriculum demands. Availability of Teaching Learning Resources (TLR) therefore enhances the effectiveness of schools as they are the basic resources that bring about good academic performance in the students.

Studies done in the past on the relationship between TLR and performance include, Likoko, Mutsotso and Nasongo (2013) on adequacy of instructional materials and physical facilities and their effect on quality of teacher preparation in colleges in Bungoma county and a study done by Mbaria (2006) on the relationship between learning resources and performance in secondary schools in Ndaragwa district. All the above studies indicated that TLR were higher in higher performing schools than in low performing schools and that there is a significant difference in resource availability in the higher performing schools and low performing schools. Also the studies indicated that most institutions are faced with challenges such as lack of adequate facilities like libraries and inadequate instructional materials and these factors tend to have a negative effect on the quality of graduates produced.

TLR help improve access and educational outcomes since students are less likely to be absent from schools that provide interesting, meaningful and relevant experiences to them. These resources should be provided in quality and quantity in schools for effective teaching-learning process.

Again, according to Phyllis (2011) as cited in Wambui (2013), instructional materials possess some inherent advantages that make them unique in teaching. For one thing, they provide the teacher with interesting and compelling platforms for conveying information since they motivate learners who want to learn more and more. Also, by providing opportunities for private study, the learner's interest and curiosity are increasingly stimulated (Likoko, Mutsotso, & Nasongo, 2013). Additionally, the teacher is assisted in overcoming physical difficulties that could have hindered his effective presentation of a given topic.

They generally make teaching and learning easier and less stressful. They are equally indispensable catalysts of social and intellectual development of the learners. Bolick, Berson, Coutts and Heinecke (2003) pointed to a good relationship between effective teachings and using of instructional materials. He argued that while some educators have been fascinated by the potential of instructional materials to enhance teaching and learning, teachers lagged behind in using instructional materials during teaching and learning. Others expressed doubts that instructional materials will ever incite teaching reform on "participation". Instructional materials are integral components of teaching-learning situations; it is not just to supplement learning but to complement its process. It then shows that, if there must be an effective teaching-learning activity, utilization of instructional materials will be necessary (Kibe, 2011 as cited in Wambui, 2013).



#### METHODOLOGY

#### **Research Design**

The study adopted quasi experimental design with mixed approach that is, quantitative and qualitative approach, because the study include both statistical data and analytical or descriptive information. Denscombe (2007) argued that a mixed approach strategy is one that uses both qualitative and quantitative methods.

The researchers found the pre-test-post-test quasi experimental design to be most appropriate for this study (Gribbons & Herman, 1997). Pre-test-post-test design was employed for the study. Twenty (20) multiple choice test items on selected topics in Electricity and Magnetism were used.

#### Population

Population refers to entire group of individuals, events or objects having common observable characteristics. A population refers to the entire spectrum of a system of interest (Panneerselvam, 2004). The population of this study comprised all students in the Senior High Schools in Nkwanta South District. The targeted population used for the study however, was all Form Three (A and B) students of Nkwanta Senior High School studying science as an elective subject as well as core.

#### Sample and Sampling Technique

Mouton (1996) defines a sample as elements selected with the intention of finding out something about the total population from which they are taken. Considering factors such as time, finances and accessibility, it is however, practically impossible to access information from all the targeted population. Form Three (3B) Science class which consists of thirty-seven (37) boys and three (3) girls was selected for the study. The class was selected on purpose and convenience. It was purposive and convenience due to the fact that it is the class with many of its students having conceptual difficulties in Electricity and Magnetism and as a result affecting their performance in Physics, and also one of the researchers happened to be a class teacher to that class. Students of Nkwanta Senior High School negative attitudes such as laziness, lack of interest, truancy, and lack of motivation towards Physics lessons, made the researchers deem it important to find out if the use of instructional resources will have any effect on their academic performance and also arouse their interest and motivate them to learn Physics.

#### **Research Instruments**

Due to the objectives of the study, there was the need to gather data on students learning outcomes and attitudes towards Physics. The research instruments used consisted of a pre-test and a post-test taken by the research participants in order to obtain data. The purpose of the tests was to measure the achievement of students constituting the sample for the study. The test items were based on some selected topics in Electricity and Magnetism and were treated during the study period. Among the topics treated were; the principles of the electric motor and generator, electromagnetic induction, the principles of transformers, resistor in series and in parallel, the magnetic effect of currents and Flemings left and right hand rules. Both the pre-test and the posttest items were based on these topics under Electricity and Magnetism which was treated during the study. Also, group interview was used to determine the students' perception on the use of instructional materials in the teaching of Electricity and Magnetism. Observation checklist was used to determine how the use of instructional materials has motivated students' interest to learn the topic.

#### Validity of the Instrument

Validity in quantitative research determines whether the research truly measures what it was designated to measure or what it was set out to measure; how truthfully the research results are. In order to ensure that the test items for the study were valid it was given to experts in Physics for a thorough examination to ensure that it measures the total content area (content validity) of the study.

#### **Reliability of the Instrument**

Reliability refers to the extent to which research findings can be replicated. A reliability test was performed to ensure accurate measurement of the instrument. Test-retest method was used to determine the reliability of the instrument. To ensure the reliability of the instrument, a pilot testing was done on a similar pre-treatment test.



This was done with Form Three (3) Physics students in Kadjebi Asato Senior High School in the Volta Region who was not part of the sample for the study. The students were made to answer the questions for the first time and re-answered the questions in a week's time to see whether their answers would be different. Their answers in both cases were almost the same and that made the reliability of the instrument to be quite high.

#### **Data Collection Procedure**

The data collection was divided into three stages: Pre- Treatment, Treatment and Post-Treatment stages.

#### **Pre-Treatment**

Before the use of instructional resources to teach, a Physics teacher who was not part of the the study was made to teach the Form Three (3B) science class of Nkwanta Senior High School some selected topics in Electricity and Magnetism without the use of instructional resources. Thus, the students were taught using traditional lecture approach. After four (4) weeks, a pre-test was conducted and marks of each sampled student were recorded against their serial numbers.

#### Treatment

The researchers arranged the form three science students for another four (4) weeks instruction. This time round, the lesson was taught with PowerPoint presentation using projector together with other instructional materials such as science laboratory equipment, electromagnetic kit, computer simulations (sun-flower) which was supplied to most of the Senior High Schools in the country by Itec Ghana Limited. The sun-flower programme contains simulation on all the concepts in Physics, Chemistry and Biology. At the end of this interactive session in which the researchers used the various scientific models and both improvised and standardised instructional resources to teach the students, test items similar to the questions used in the pre-test were administered to the students as post-test.

#### **Treatment Activities**

In order to produce good results, the researchers selected instructional resource materials they deemed appropriate to design lessons that would help the learning needs of the students. Some of the selected topics treated under Electricity and Magnetism are discussed in details here.

#### Week 1

#### Activity 1: Electromagnetic Induction

**Materials:** bars of magnet, electric wires, electric bulb, rubber bands, insulating tape armature, steel yoke, split pins, knitting needles, rivets and a base. All from the electromagnetic kit.

**Procedure:** The setup is shown in Figure 3. The Frame was rotated in a uniform magnetic field. The ends of the frame were supported by two rings which were connected to a small electric bulb. As the students rotate the frame, the bulb lights. This is because of the phenomena of electromagnetic induction. Electromagnetic induction is the phenomenon of production of potential difference across the ends of a conductor moving in a magnetic field.

This activity was also used to confirm Fleming's right hand rule as students track the directions of current, the magnetic field and the rotation of the frame using their right hand as shown in Figure 4.

Fleming's right hand rule: The first finger points in the direction of the field, the thumb in the direction of the motion of the conductor and the second finger points in the direction of the induced current in the conductor.







**Figure 3: Electromagnetic induction** 



#### Week 2

Activity 2: Construction of Electric Motor

Materials: Electromagnetic kit, magnets, wires, rubber bands, insulating tape batteries, armature, steel yoke, split pins, knitting needles, rivets and a base.

**Procedure:** The set-up for construction of electric motor is as shown in Figure 5. The wire was wound round a cuboid shaped plastic material with long nail/metal rod piers through its centre as the pivot of rotation to form the armature. When the wire brushes connected to a battery was brought in contact with the ends of the wounds on the opposite side of the nail/metal bar in a magnetic field, the coil with the cuboid started rotating. This activity was also used to confirm Fleming's left hand rule as the students use their left hands to trace the directions of the current, magnetic field and the force.



**Figure 5: Electric Motor** 

#### Week 3

Activity 3: The Magnetic Effect of Electric Current Materials used: Iron nail, electric wire, batteries, paper clips.

Procedure: In this activity, the students were guided to verify the phenomenon of magnetic field being generated when current flows through a conductor using a simple circuit as shown in Figure 7. An electric wire was wound around an iron nail and the two together brought near a paper clip but there was no attraction. When the students connect a battery to the ends of the wire and the set-up brought to the paper clips they were attracted by it. This proves that magnetic field is really generated when current passes through a conductor.





Figure 7: The Magnetic Effect of Electric Current

#### Week 4

Activity 4: The Effective Resistances of Resistors Connected in Series and in Parallel Materials: Resistors, electric wires, breadboard and digital multimeter.

*Procedure:* Students were guided to connect resistors in series and then in parallel on breadboard and in each case a digital multimeter was used to measure the effective resistances across the ends of the two connections as shown in Figure 8. The measured values were compared to the already calculated values.



Figure 8: Components on a breadboard

#### **Analysis of Data**

The data collected from the students' pre-treatment and post-treatment test results were analysed based on the research questions for this study.

#### Analysis with respect to Research Question Two

**Research Question 1:** To what extent will the use of instructional materials influence the academic performance of Nkwanta Senior High School students in Electricity and Magnetism?

#### Marks of Students at Pre-Treatment Test

Tables 1 and 2 present the scores of the samples and their corresponding converted percentage scores on West African Examination Council (WAEC) and Ghana Education Service (GES) standards with its frequencies and percentage frequencies after the pre-treatment test.

Score	Percentage Score	Frequency	Percentage frequency
4	20	9	22.5
5	25	4	10
6	30	3	7.5
7	35	6	15
8	40	11	27.5
9	45	2	5
10	50	1	2.5
11	55	1	2.5
12	60	1	2.5
17	85	2	5
Total		40	100

Table 1: Frequency	v and Percentage	scores of students'	Pre-Treatment test
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From Table 1, each raw score was giving a weight of 5% which indicates that a total score of 20 is a 100% on the percentage score. The raw scores obtained ranged from 4 to 17 which were converted from 20% to 85% on the percentage scale. From Table 1, the percentage score of 20 was obtained by 9 students representing 22.5% of the respondents. Also 2 students obtained the highest percentage score of 85 representing 5% of the sample. The percentage score of 40 was recorded as the highest frequency mark for 11 students representing 27.5% of the sample obtained.

#### Grades of the students after the Pre-Treatment Test

Table 2 presents the pre-treatment test marks of the students during the traditional method of teaching based on the West African Examinations Council (WAEC) and Ghana Education Service (GES) grading system. This shows how the subject had performed on the WAEC and GES grading standard.

Expected performance	Grade	Remarks	Frequency	Percentages
0–39	F9	Fail	22	55
40–54	D7–E8	Pass	14	35
55–69	C4–C6	Credit	2	5
80–100	A1	Excellent	2	5
Total			40	100

Table 2: Grades of students during the Pre-Treatment test

From Table 2, the best grade was A1 which had a frequency of 2 thus representing 5% followed by grade C4 to C6 with frequency of 2 representing 5% then grade D7 to E8 with frequency of 14 representing 35% and finally grade F9 representing 55% of the sample obtained. These data suggest that the best grade obtained during the pre-treatment test was A1 and the least was F9 whiles the grade obtained by majority of the students (22 students) was F9 which represented 55%. The results showed that majority of the students had failed remark according to the WAEC and GES grading system. This implies that more than one-third of the sample failed because on the WAEC grading system F9 was rated as a very poor remark. In this study, the data collected on the pre-treatment test was in support of Clinton and Kohlmeyer (2005) study that showed no change in the students' results of the concept taught during the traditional method of instruction.



#### **Students Marks at Post-Treatment Test**

Tables 3 and 4 present the scores of the samples and their corresponding converted percentage scores on WAEC and GES standards with its frequencies and percentage frequencies.

Score	Percentage score	Frequency	Percentage frequency
11	55	1	2.5
12	60	1	2.5
13	65	1	2.5
14	70	1	2.5
15	75	4	10
16	80	9	22.5
17	85	9	22.5
18	90	7	17.5
19	95	5	12.5
20	100	2	5
Total		40	100

Table 3: Frequency and Percentage scores of students' Post-Treatment test

From Table 3, each raw score was giving a weight of 5% which implies that a total score of 20 is a 100% on the percentage score. The raw scores obtained ranged from 11 to 20 which were converted from 55% to 100% on the percentage scale during the post-treatment test. Table 3 therefore presents the percentage score of 55 which was obtained by 1 student representing 2.5% of the respondents. Also 2 students obtained the highest percentage score of 100 representing 5% of the sample. The percentage scores of 80 and 85 were recorded as the highest frequency mark for 9 students each representing 22.5% each of the sample obtained.

#### Grades of the students after Post-Treatment Test

Table 4 presents the post-treatment test marks of the students during the instructional material based teaching on the WAEC and GES grading system. This showed how the subject had performed on the WAEC and GES grading standard.

Expected performance	Grade	Remarks	Frequency	Percentages
55–69	C4–C6	Credit	3	7.5
70–74	B3	Good	1	2.5
75–79	B2	Very Good	4	10
80–100	A1	Excellent	32	80
Total			40	100

Table 4: Grades students made during the post-intervention test

From Table 4 the best grade was A1 which had a frequency of 32 thus representing 80% followed by grade B2 with a frequency of 4 representing 10%. Then grade B3 with frequency of 1 representing 2.5% and finally grade C4 to C6 with frequency of 3 representing 7.5%. These data suggest the best grade obtained during the post-treatment test was A1 and the least was C4 to C6 whiles the grade obtained by majority of the students was A1 which represents 80% and the least was a B3. The results showed that majority of the students had excellent remarks according to the WAEC and GES grading system. In this study, the data collected on the post-treatment test was in support of Cardoso, Cristiano andArent (2009) study which recommended the need for the development and implementation of new educational practices to make classrooms more interesting and interactive and also to increase the performance of students.



#### Analysis using single paired sample t-test

With the administration of the test items, the researchers were interested in finding out whether the use of laboratory equipment, computer simulations and electromagnetic kit in teaching electricity and magnetism had any effect on the performance of the students as against the traditional method of teaching. Therefore paired sample t-test analysis was performed on the mean scores for pre-treatment test and post-treatment test. This was done to determine whether significant difference exists between the mean scores.

Test	Ν	Mean	Sd	t-value	Mean difference	p-value
Pre-Intervention	40	7.22	3.068	32 576	9.48	0.000
Post-Intervention	40	16.70	1.977	52.570	2.40	0.000

\*p<0.05, N-Number of Students

Table 5 presents the mean score for pre- treatment test of students taught through the traditional method of teaching and the mean score for post-treatment test of students taught through the use of laboratory equipment, computer simulations and electromagnetic kit in teaching and learning of electricity and magnetism. It is observed that the mean score of the post- treatment test (Mean = 16.70, Sd = 1.977) is much higher than the mean score of the pre-intervention test (Mean = 7.22, Sd = 3.068). Also the total performance scores of the entire sample put together on the post- treatment test (668) was higher than the total scores at the pre- treatment test (289). This implies that there was an improvement in performance of 39.6% during the post- treatment test. A paired sample t-test conducted to evaluate whether a significant change occurred between the pre- treatment test and post- treatment test results showed that the difference between the mean scores was significant at pvalue of 0.000 which the significant was set at alpha ( $\alpha$ ) value of 0.05; hence there was a significant difference. The researchers therefore conclude with 95% confidence that the samples performed better at the post- treatment test. The researchers therefore had sufficient information to conclude that there was a significant difference between the use of laboratory equipment, computer simulations and electromagnetic kit in teaching electricity and magnetism and the traditional method of teaching. Difference in the mean values of the pre- treatment test (7.22) and post- treatment test (16.70) was 9.48 indicating that there was an appreciable effect. This implies that there was an appreciable improvement in the post- treatment test as compared to the pre- treatment test.

#### Analysis with respect to Research Question Three

Research Question 3: How will the use of instructional resources motivate students to learn Electricity and Magnetism in Nkwanta Senior High School?

This question sought to establish the researchers' observation on how motivated the students have become after the intervention was used. It covers the perception of students about the use of instructional resources as compared to the traditional method of teaching. As indicated earlier, group interview was conducted to gather the views of the students on their perception of the use of laboratory equipment, computer simulations and electromagnetic kit in teaching and learning of Electricity and Magnetism and traditional method of teaching. The questions covered the assimilation of the concept and their preference in terms of the teaching strategies they were exposed to.

## Assimilation of concept and preference with the use of laboratory equipment, computer simulations and electromagnetic kit in teaching and learning

- Majority of the sample used for the study said they perceived the laboratory equipment, computer simulations
  and electromagnetic kit in teaching and learning of Electricity and Magnetism to be illustrative, quick and
  practical as it relates familiar objects and learners' environment to abstract concepts.
- Further, majority of the sample also said that the use of instructional resources allowed them with different learning skills to communicate with the lesson at their own best ways.



• The entire sample said that the instructional resources guided them to understand better the concepts in Electricity and Magnetism. They were of the view that when the traditional method was employed there were no such clarity and understanding of some of the concepts.

#### Assimilation

The students said they absorbed more during the use of instructional resources in teaching than the traditional method of teaching since the instructional materials aided them to understand better the concepts in Electricity and Magnetism. They indicated that the use of instructional materials helped them built up a mental picture on their brains on the concepts taught as compared to the traditional method of teaching. Therefore they found it interesting and that motivated them to learn.

#### Preference

The students said they preferred the use of instructional materials method of teaching to the traditional lecture approach since they could remember what was taught and could narrate enough of what they observed and viewed than that of the traditional method.

#### Attitude of students towards Physics lessons

The researchers studied the attitude of the students towards Physics during the use of the traditional lecture method and the use of the instructional materials in teaching using observation checklist. The outcome of their observations is presented in Table 6.

Table 6: Students'	attitude towards	<b>Physics using</b>	Observation	Checklist

	Traditional Lecture Method			Using Instru	ctional Mo	<i>iterials</i>
Attitude	More	Less	Not at all	Not at all	Less	More
Curiosity						
Ready to ask questions						
Working on their own						

It was observed that the students have become more curious, and were always ready to ask questions both during classes and outside the classroom settings when the instructional materials were used in the teaching of Electricity and Magnetism. They started to work on their own by building electric motors using local materials. These attitudes were not the case when the traditional lecture method was used in teaching the same topic. For that reason, the researchers can then conclude that the use of instructional resources arouses students' interest and therefore motivate them to learn.

This implies that the teaching of physics without the use of instructional materials may certainly result in poor academic performance. Students get motivated when they are actively involved in the teaching learning process and this will minimize teaching of Physics in abstraction.

#### **Discussions of results**

The findings of this study revealed that collaboration of computer simulations with didactical science activities will help learners in creative and critical thinking, acquire skills for processing and presentation of information, and also offers educators alternative suggestions for teaching/learning, and how issues concerning physical phenomena should be approached. Teaching and Learning in this way will complete the knowledge of the students and make lessons more attractive to motivate learners. This is in line with the research findings of Fadeiye (2005), who posited that instructional materials are essential and significant tools needed for teaching and learning of school subjects to promote teachers' efficiency and improve students' performance. They make learning more interesting, practical, realistic and appealing. They also enable both the teachers and students to participate actively and effectively in lesson sessions. They give room for acquisition of skills and knowledge and development of self- confidence and self- actualization.



The findings also revealed that the mean score of the post-treatment test (Mean = 16.70, Sd = 1.977) was much higher than the mean score of the pre-treatment test (Mean = 7.22, Sd = 3.068). Also the total performance scores of the entire sample put together on the post- treatment test (668) was higher than the total scores at the pre- treatment test (289). This implies that there was an improvement in performance of 39.6% during the post-treatment test. A paired sample t-test conducted to evaluate whether a significant change occurred between the pre- treatment test and post- treatment test shows that there was a significant difference between the mean scores at p-value of 0.000 in which the significant was set at alpha ( $\alpha$ ) value of 0.05. These findings are also in line with findings of Oladejo, Olosunde, Ojebisi and Isola (2011) who also asserted that there is a significant difference in the academic performance of students taught in Physics using standard instructional materials and those in the conventional instruction.

In addition, this study revealed that the use of instructional resource such as audios and videos make abstract concepts real to students since they will help them to observe, feel, practice and draw better conclusions. Instructional materials also help learners connect teaching and learning to everyday life since teaching and learning materials enhances students' curiosity and interest. Thus, they contribute to students' systematic knowledge and maturity, thereby motivating them to learn. This also affirms the research findings of Likoko, Mutsotso and Nasongo (2013) and Bolick, Berson, Coutts and Heinecke (2003) in their studies on adequacy of instructional materials and physical facilities and their effect on quality of teacher preparation and students' motivation in colleges. All the above studies indicate that TLR help improve access and educational outcomes since students are less likely to be absent from schools that provide interesting, meaningful and relevant experiences to them. These resources should be provided in quality and quantity in schools for effective teaching-learning process.

#### CONCLUSION

In conclusion, instructional resources and materials are very powerful tools in Physics education, if achievement or performance is an objective. The use of instructional materials in instructional activities such as science laboratory experiments, computer models and simulations and power-point presentations makes lessons more interactive thereby making learners more active than being passive during lessons.

In addition, the use of instructional resource such as audios and videos make abstract concepts real to students since they will help them to observe, feel, practice and draw better conclusions. Instructional materials also help learners connect teaching and learning to everyday life since teaching and learning materials enhance students' curiosity and interest. Thus, they contribute to students' systematic knowledge and maturity.

#### Limitations

Ideally the researchers should have targeted a large number of Senior High Schools (SHS) in this study. However, due to proximity, accessibility, financial constraints and limited time the study concentrated on the Form Three Science Students at Nkwanta Senior High School.

In researches of this nature, where direct contact with the respondents is made, there is bound to be psychological and emotional imbalances which can make the respondents artificial and would not reflect normal classroom situations.



#### Recommendations

Based on the findings of this research, the following recommendations are put forward:

- Ministry of Education and Ghana Education Service should ensure frequent supply of instructional resources for use by teachers for effective teaching and learning. Such resources could include locally produced materials produced by teachers and resource experts for better lesson delivery.
- Ministry of Education and Ghana Education Service should provide funds to support local production of instructional materials by the teachers and encourage more teachers to produce and use them.

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## Effectiveness of Cognitive Techniques on Self-Efficacy and Academic Achievement of High School girl's Students in Amol City-IRAN

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#### ABSTRACT

Students with high self-efficacy achieve more advancement compared to those with weak self-efficacy. The main purpose of this study is to determine impact of cognitive techniques on self-efficacy and academic achievement of high school girl students. Method in this study has been experimental method using pretest-posttest with control group. Statistical population of the study consists of all high school's third grade girl students of Amol City during academic year 2015-2016. Firstly, cluster random sampling is applied and a school is selected and all third grade high school students with average below 15 (87 people) were tested by self-efficacy test. Students with mark below 57 in self-efficacy test were 49 students and 30 out of them were selected randomly and were placed in two 15-member control and experimental groups. Then, interventions in experimental group were applied for 8 sessions each session with 90 minutes and control group was in waiting list. Then at the end of 8 sessions, Both of experimental and control groups answered Sherer et al self-efficacy scale. Academic achievement, average of first and second semesters of students have been applied so. The data analyzed by multivariate covariance analysis by spss 22.The results from the study indicate that cognitive techniques have significant effect (p=0.00) on enhancing self-efficacy and academic achievement of students.cognitive techniques have can promote self-efficacy and academic achievement of high school girl students



#### **INTRODUCTION**

Self-efficacy is one's belief in one's ability to succeed in specific situations or accomplish a task (Bandura, 1977; quoted from Sumers and Sumers, 2012). Self-efficacy was for the first time presented by Albert Bandura. Bandura has defined self-efficacy as the belief of individuals in this issue that they can do something successfully and gain positive outcomes of it. In framework of theory of self-efficacy of Bandura, it is mentioned that people with positive belief about their abilities indicate more effort in doing their tasks compared to those have doubt in their abilities. People with high self-efficacy use more learning strategies than those with low efficacy (Bandura, 1992; Velasquez et al, 2003).

Negative core beliefs are formed when interacting with parents during childhood. These core beliefs classified to several categories including belief about self, belief about others, and belief about life and world. Beliefs about self can be negative or positive. Negative core beliefs about self are classified to two categories loveless and inadequate beliefs. Negative core beliefs effect on information processing so that information are distorted (Judith Beck, 1995; Leahy, 2003).

Self-efficacy beliefs are those beliefs we have about our efficiency and competency in a task. These beliefs can effect on our performance and if these beliefs are negative, they will interfere with our performances in cognitive, motivational, and emotional functions (Benight& Bandura, 2004). Academic achievement is one of the important aspects affected by beliefs. Academic achievement associated with educational learning level among people that is evaluated by different tests (Gaddis, 2013). Academic achievement is not only related to learning but also is a multi-dimensional variable that encompasses mental, personality, social, and physical components in addition to learning level (Newcomb et al, 2008).

The results of Pang (2012) indicated that self-efficacy beliefs have a considerable effect on academic performance of students.

Cognitive approach introduced by Beck for challenging and changing dysfunctional beliefs and automatic thoughts and controlling cognitive distortions. Cognitive errors can effect on information processing and distort received information. It is possible to control cognitive distortions and negative beliefs in particular, negative beliefs about self-efficacy using methods, which are major cognitive methods for measuring loss and benefit of a belief, considering evidences, and examining outlook of a belief (Beck et al, 1979; Leahy, 2003; Burns, 1998). This is also true about adolescents. People with low-efficacy consider the tasks more difficult than others and this can enhance stress in them. On the contrary, high self-efficacy beliefs cause calmness and closeness to difficult tasks. Hence, it can be strong predictor for achievement and advancement of people (Psjares et al, 2002).

Moreover, sense of self-efficacy in students can help for adjustment in regard with doing educational tasks (Gian, Vittorio et al, 2006).

Scholars have found that when education is performed using cognitive-behavioral approach, it can be an effective method to work with negative thoughts and problematic behaviors in adolescents. In this method, people are supported to learn to evaluate their thoughts and cognitive distortion about unpleasant events explicitly. In other words, they can challenge them using explicit evidence, correct cognitive distortions and gain new and adaptable cognition about the world and the future and self. Moreover, the method includes declining evaluation of negative thoughts and manner of fighting them and training effective cognitive-behavioral strategies (Sapp, 1999).

In the cognitive-behavioral theory, people can be described in relation to their thoughts, emotions and behaviors. The main and primary goal of them is reconstruction of consciousness thoughts using positive self-efficacy techniques, in which people are helped to change innate negative thoughts to positive thoughts (Payne, 2005).

Cognitive techniques can improve negative attitude and beliefs about self and others and helps them to have new beliefs about their social and academic achievements (Kenedy and Dopke, 1999).

Using group cognitive-behavioral approaches is one of the most important advantages of this approach. The approach has some advantages including being supported by group members, learning succession and removing negative label and creating more safety for adolescents to express their problems (Kenerly, 1995, trans. Mobini, 2003).

TCHET

The most important determinant factor of interestingness or lack of interest of students in lessons and tasks is learning successful experiences or their failure in acquisition of different lessons. It means that if students gain successful experiences during academic years, their interest in learning different lessons would be increased gradually. As a result, positive concept of self would be created in them. However, if the experiences are mostly along with failure, negative concept would be created gradually in their mind about their own and their abilities and as a result, they may face lack of interest in education and academic achievement (Seif, 2010).

In a study adopted by Abolghasemi, Beigi and Narimani (2011) under the title of assessing effectiveness of two methods of cognitive-behavioral education and emotion regulation skills in self-efficacy and academic adaptability of students with exam anxiety, the investigations are done on 60 students with exam anxiety. The studentswere divided to two control and experimental groups randomly. For experimental group, cognitive-behavioral approach and emotion regulation skills have been performed. Obtained results indicated that cognitive-behavioral method can affect reduction of anxiety and increase in self-efficacy and academic achievement of students significantly.

Einar and Sidsel (2009) have investigated the relationship of self-concept and self-efficacy with achievement motivation in field of mathematics. The results showed that both variables of self-efficacy and self-concept are important to predict educational success of students.

Givan Vittorio et al (2006) have also found in their study that sense of self-efficacy is in positive and significant correlation with accountability to do educational tasks and get high average in final exams, job satisfaction and academic achievement of students.

Winsler et al (2004) have conducted a study on high school students and have found that students with high selfefficacy have less behavioral problems and better social skills, they have more efficient interaction at school and group and gain high marks in class activities.

#### METHODOLOGY

In terms of subject and main goals of the study, it is applied research and in terms of data collection method, it is experimental study. Due to location of the study, it is a field research and is adopted using pre-test posttest pattern with experimental and control groups. Statistical population of the study consists of all high school girl students of third grade in Amol City. In this study, applied method is experimental method and its pattern is pretest-posttest with control group. Firstly, a school is selected using cluster random sampling method and all high school students of third grade with average below 15 (87 people) have taken self-efficacy test. Students with mark below 57 in self-efficacy test were 49 students and 30 out of them were selected randomly and were placed in two 15-member control and experimental groups. Then, interventions in experimental group were applied for 8 sessions each session with 90 minutes. No intervention was applied for control group. Then at the end of 8 sessions, posttest was performed for both experimental and control groups.

#### DATA COLLECTION INSTRUMENT

**Self-efficacy questionnaire (SE)**: applied self-efficacy scale in this study has been Sherer et al (1982) self-efficacy scale. The original version of this test contains 36 items and according to adopted analyses, only those items were not excluded that had value of 40% in each social and general factor. Accordingly,13 items without the specifications were excluded and the test was declined to 23 items. Scoring method of self-efficacy scale is to this manner that to each item, a score would be given from 1 to 5. Sores of items number 1, 2, 8, 9, 15 and 13 (right to left) have been increased and score of remained items (left to right) is increased. Total score of the questionnaire is equal to 85.

Reported reliability coefficient by Sherer et al (1982) is relatively high and satisfactory. Obtained Cronbach's alpha for subscale of self-efficacy in different countries is reported as follows: 88% in Canada; 84% in Spain; 81% in Costa Arica; 81% in Germany; 88% in Britain; 82% in Japan; 85% in Korea and 75% in India. Obtained coefficients indicate internal reliability of options of this scale among different people across the world.

Schwartz et al (1997) showed the internal consistency coefficient of self-efficacy scale for students in Germany to 84%; in china to 91% and in Spain to 81%. In order to investigate reliability of self-efficacy scale, split-half method is applied. Reliability coefficient of the test was obtained to 76% using Spearman-Brown method and split-half method of Gustman. Cronbach's alpha or total consistency of questions is also obtained to 79% that has been satisfactory (Rajabi, 2006).



In order to measure validity of self-efficacy scale, obtained scores by it have been correlated to measures of several personality traits. The personality measures includeInternal locus of control, interpersonal competence, my strength, self-esteem, assertiveness, male traits and emotional harmony (Sherer et al, 1982, Sherer and Adam, 1983; Rahmani, 2010).

Another research instrument is average of first and second semester of sample students used to measure their academic achievement (average of first semester is considered as pretest and average of second semester as posttest).

### TRAINING PACKAGE

Training package is due to cognitive therapy approach (Beck et al, 1979). We trained students in 8 sessions for Identifying automatic thought and core beliefs especial self-efficacy belief sand challenging them with Cognitive techniques. Both of experimental and control groups answered Sherer et al self-efficacy scale the end of intervention.

For data analysis purpose, descriptive statistical methods (mean value and SD) is used and inferential statistics of MANCOVA have been used to test hypotheses.

#### RESULTS

The results from adjusted mean value and covariance results for dependent variables are presented in tables 1 and 2.

Table 1: statistical features of self-efficacy and academic achievement components in two experimental and control groups

	experime	experimental group control				covariance	
variable	mean	sd	mean	std. error	F (26.1)	Р	ETA
self-efficacy	62.79	1.507	52.47	1.507	22.107	0.000	0.460
academic	15.94	0.172	14.20	0.172	48.704	0.000	0.652
achievement							

Table 2: MANCOVA	analysis of F rati	o for combined variable
1 4010 2. 1011 100 111	analysis of 1 Tau	

Source	value	F (25.2)	sig	ETA
combined variable	0.300	29.135	0.000	700
(group)				

Note: multivariate F ratio is obtained from Wilkes-lambda approximate

In table 1, adjusted mean values of components of dependent variable can be observed. Effect of random variables of the mean values indicates that mean value of experimental group is lower than control group. Obtained results from tables indicate that there is significant difference between experimental group that is under effect of cognitive technique training and control group that is under no education method (Eta=0.700, P=0.000 and F(2,25)=29.135). The difference is in benefit of trained group due to adjusted mean values.

#### DISCUSSION AND CONCLUSION

The present study is adopted to investigate effectiveness of cognitive techniques in self-efficacy and academic achievement of third grade high school girl students. As cognitive-behavioral treatment is focused on beliefs, emotions and feelings of individuals and is aimed in changing and modifying beliefs, it is suggested effectively to work with adolescents and to reconstruct disabling thoughts and their negative thoughts. Obtained results from the study indicate that cognitive techniques can affect general and positional self-efficacy of control group effectively and successfully. This result can be discriminated in this manner that learning new and suitable behavior to encounter anxiety can create dominance and ability in people. Moreover, it seems that responsible mechanism for success of cognitive-behavioral treatment is acquisition and application of new cognitive and behavioral coping skills. Gaining coping skills can result in success against internal or outside pressures and the successes can enhance self-efficacy belief in people.

Moreover, to discriminate the finding, it could be mentioned that people with higher academic achievement have higher self-concept and self-esteem than others. One of the reasons for this situation is that students with self-confidence have more courage to attempt and have strong motivation to achieve what they want and students with negative attitude to their own evaluate their ability and intelligence in low level and create bad situation for their education and work through the limitations (Kelinche, 1994; trans. Mohammadkhani, 2001).

Obtained results from the study are in consistence with findings of Abolghasemi, Beigi and Narimani (2011). They have assessed effect of two methods of cognitive-behavioral education and emotion regulation skills on self-efficacy and academic achievement of students with exam anxiety on 60 students with exam anxiety. The students were placed in two experimental and control groups randomly. For experimental group, cognitive-behavioral technique and emotion regulation skills have been applied. Obtained results indicated that cognitive techniques are effective in reduction of anxiety and enhancement of self-efficacy and academic achievement of students significantly.

The findings have been also in consistence with the findings that cognitive-behavioral education can affect decrease is beliefs or inefficient academic feedbacks (Black and Hersen, 2006; trans. Izadi and Maher, 2005).

The result has been in consistence with findings of Judge and Bono (2001) that self-efficacy can affect strategies of emotion regulation skills as a cognitive structure and has basic ability to predict performance and academic achievement of individuals. They have found that the relationship between self-efficacy and emotional stability is positive and people who are able to regulate their emotions have higher self-efficacy than others. The study indicated that the focus point of individuals and self-efficacy beliefs are important determinant factors in regard with anxiety and cognitive orientations. According to the findings, it could be concluded that due to cognitive nature of self-efficacy variable, cognitive-behavioral education would be certainly effective.

Moreover, The results from the study have been in consistence with findings of Purdie &Hattie (1996). They have found in their study that students with high academic performance gain high points in metacognitive test. According to obtained results from the study, it could be mentioned that metacognition plays key role in cognitive activities and affects performance of individuals in different cognitive domains including academic achievement.

Obtained results from the study indicate that cognitive techniques can affect self-efficacy and academic achievement of students in third grade of highs school significantly; although no change was observed in control group.

Conflict: There is no conflict

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# Effectiveness of Dialectical Behavior Therapy (DBT) in Reduction of Aggression in Female Students in Tehran

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#### ABSTRACT

dialectical behavior therapy techniques can be used as useful and effective method in reduction of many clinical symptoms. In this study, Efficacy of dialectical behavior therapy in reduction of aggression of female students in Tehran City is investigated.

This study is in kind of empirical study with pretest posttest design with control group. Statistical population in this study consists of all high school female students of Tehran (n=674) educating during academic year of 2015-2016. First, cluster sampling is used and 4 schools are selected from schools of Tehran and from each couple of schools, 2 classrooms were selected and the students with high score in Buss-Perry Aggression Questionnaire (AQ) were selected as sample. Then, 30 students were selected using random sampling method and were placed in two groups with 15 people in each group. At the end of intervention all the participants responded to post-test. Buss-Perry Aggression Questionnaire (AQ) was instrument in this study. Data were analyzed by covariance in SPSS-18. DBT could significantly reduced aggression in girl adolescents and there is a meaningful difference between 2 groups (p<0.01). DBT could significantly reduced aggression symptoms in girl adolescents.



#### **INTRODUCTION**

Adolescence is a high risk phase for the development of some symptoms and behavioral problems. Anxiety and aggression are of most frequent symptoms and behavioral problems in this phase throughout the world (Blake & Hamrin, 2007, Rapee, Kennedy, Ingram, Edwards & Sweeney, 2005, Barrett, Duffy, Dadds & Rapee, 2001) and in Iran (Sadeghi, Farajzadegan, Kelishadi & Heidari, 2014, Zarafshan, Mohammadi, Salmanian, 2015, Dodangi, Habibi Ashtiani, Valadbeigi,2014).

These two behavioral problems can impact adolescents' health and future in several ways. For example several studies have proved that adolescents with anxiety cannot be completely successful in school performance and also, they show greater fatigue and sleep disturbance, poorer physical health, global cognitive impairment and social disability (Mazzone, Ducci, Scoto, Passaniti, D'Arrigo Valentina ,& Vitiello, 2007, Haller, Cramer, Lauche, Gass, & Dobos, 2014).

Studies that have examined the role of aggression in development of adolescents have concluded that it disrupts learning, and drains a significant proportion of mental health and family resources (Hawley, Johnson, Mize & McNamara, 2007). Besides, it has been cleared that aggression is important risk factors of smoking, substance abuse, second depression, other behavioral problems and academic failure (Khademalhosseini, Ahmadi, , Khademalhosseini, 2015, Zinat Motlagh, Ataee, Jalilian, MirzaeiAlavijeh, Aghaei, KarimzadehShirazi, 2013, Pine, Cohen, Gurley, Gurley, Brook J, Ma, 1998, Woodward, & Fergusson, 2001, Keenan, & Hipwell, 2005, Chakraburtty, 2005).

Given these negative effects, they should be seriously considered in mental health programs provided for adolescents. One of the novel treatment approaches is dialectic behavioral therapy (DBT) that has attracted many psychologists in several fields.

DBT is a cognitive-behavioral treatment that regulates various behavioral difficulties associated with severe and chronic emotion dysregulation (Fruzzetti & Levensky, 2000). Because of the DBT definition of problematic behavior as the result of one or more of the following: skills deficit, cued responding, reinforcement of maladaptive behavior or punishment of adaptive behavior, or cognitive factors, primary DBT interventions are skills, exposure, contingency management, and cognitive restructuring training. The primary dialectic that informs all aspects of DBT is change versus acceptance. Thus, interventions include both change- and acceptance oriented techniques and clients are taught skills for both changing and accepting themselves and reality as it is (Rizvi, 2011).

Although, DBT was first introduced by Marsha Linehan for borderline personality disorder (BPD) treatment (Linehan, 1991), but it has been accepted as a truly effective treatment for a variety of mental health conditions among diverse populations (DeVylder, 2010) including, individuals with BPD and substance use disorders (Linehan , Dimeff , Reynolds, Comtois , Welch , Heagerty ,& Kivlahan ,2002, Renee,2009, Stiglmayr , Stecher-Mohr , Wagner , Meißner , Spretz , Steffens , Roepke , Fydrich , Salbach-Andrae , Schulze & Renneberg,2014 ), eating disorders (Telch , Agras , Linehan, 2000, Soleimani , Khodavirdi & Ghasemzadeh, 2014), depressed elderly clients with personality disorders (Lynch, Morse , Mendelson & Robins,2003),DBT is effective for controlling self-destructive behaviors ( Patrick, John, Omar, & Panos,2014, Saffarinia ,, Nikoogoftal ,& Damavandian , 2014, Priebe , Bhatti ,Barnicot,, Bremner , Gaglia , Katsakou , Molosankwe , McCrone ,, Zinkler ,2012), increase the quality of sleep and reduce anxiety in patients with irritable bowel syndrome (IBS) (Mohammadi, Gholamrezaei,& Azizi, 2015), female aggressive in a residential setting (Trupin ,, Stewart , Beach , & Boesky, 2002), emotion regulation and perceived social support in patients with coronary heart disease (Linehan, 1993), depression (Babaei, Fakhri, Jadidi, Salehi, 2015) and suicidal adolescents (Alavi, Modarres ,Ghoravi, Amin Yazdi, & Salehi, 2015, Katz, Cox, Gunasekara , & Miller, 2004, Geddes , Dziurawiec & Williams , 2013 ). The effectiveness of DBT in reducing aggression has been confirmed in some studies in different populations (Linehan , Comtois , Murray , Brown ,


Gallop, Heard, Korslund, Tutek, Reynolds, Lindenboim, 2006 Jamilian, Malekirad, Farhadi, Habibi & Zamani, 2014, Clarkin, Leavy, Kernberg, Lenzenwerger, 2007, Oler, Pascual, Tiana, Barrachina, Campins, Gich, Alvarez, Pérez, 2009, Miller, Rathus, Linehan, 2007, Vanden Bosch, Verhuel, Schippers, Brink, 2002, Asmand P, Mami S, Valizadeh, 2015, Kroger, Schweiger, Valerija, Ruediger, Rudolf, Reinecker, 2006) but its efficacy in adolescents has not been sufficiently studied in Iran.

The present study evaluated the effectiveness of DBT techniques in reduction of aggression in adolescents. Because of lack of studies about students in Tehran, we focused on this population.

#### METHODOLOGY

Among 674 girl's high school students in 2 regional municipality in Tehran, Iran, two high schools and two classes selected randomly for this experimental study. The final sample number was 30 that randomly placed in two groups: case group and control group (fifteen in each of them). Pre-test was implemented in baseline for both groups. Then, case group took part in twelve (2 hours) Dialectical Behavior Therapy sessions while control group were in waiting list. Thereafter, both groups completed post-test. Participants in experimental group received DBT intervention in group twelve sessions (2 hours in every week): DBT techniques included: Mindfulness, emotion regulation, Distress tolerance and Effective communication (Linehan, ,1993).The content of sessions of included:

Mindful breathing, Mindful eating, Mindful walking and mindful awareness (2 session). Emotion regulation skills included: Awareness of emotion, describe of emotion, reduction vulnerability to emotion and express of emotion (4 session). Distress tolerance skills included: self soothing techniques, distraction techniques, relaxation techniques and breathing techniques (4 session). Effective communication skills included: mindful communication, assertiveness, negotiation communication and conflict resolution communication (2 session).

All of the participants were assessed in baseline and at the end of intervention. The instrument was used in this study was Buss-Perry Aggression Questionnaire (AQ):

#### INSTRUMENT

**Buss-Perry Aggression Questionnaire (AQ):** This is a self-reported and no bias scale that was published in 1992 by Buss and Perry and quickly became one of the most useful scales in the measuring aggression (Shelton, Kesten, & Zhang, 2011, Gerevich, Bácskai & Czobor, 2007, Abd-El-Fattah, 2007). AQ reliability and validity has been confirmed in Iran. It includes four subscales: physical aggression, verbal aggression, anger and hostility (Alami, Shahghasemi, Davarinia Motlagh Ghochan, Baratpour, 2015).Data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (Covariance analysis) in SPSS-18.

#### RESULTS

Mean and standard deviation of three groups scores in pre-test and post-test are shown in Table 1.

Levin test was used to determine the similarity of variances in aggression in participants. The results showed that the variances of both variables statistically were similar in both groups [Levin test results for aggression was (F= 12.419), (DF1 = 1), (DF2 = 28), (p = 0.001)]. With these results, the assumptions for the analysis of covariance were confirmed.

The results of covariance are demonstrated in tables 2. As you can see DBT was significantly effective in reduction of aggression in participants (p<0.001).



Table 1. Mean and sta	ndard deviation is	n pre-test and	post-test
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	Case group		Control group	
	Pre-test	Post-test	Pre-test	Post-test
aggression	131.66±7.006(SD)	60.73±6.04(SD)	131.2±6.93(SD)	130.4±7.66(SD)

#### Table 2. Results of covariance analysis of aggression

		Sum of squares	d.f	Mean squares	F	Р	Eta
group							
	aggression	36251.401	1	36251.401	1384.976	0.000	0.982

#### DISCUSSION

The effectiveness of DBT in reduction of aggression in girl adolescents is confirmed in the present study. The effectiveness of DBT has been approved in several studies on clinical and non-clinical populations. Shelton and colleagues (2011) found that DBT- Corrections Modified (DBT-CM) was effective upon behaviorally challenged incarcerated male adolescents . Panos and colleagues (2014) emphasized on DBT efficacy in controlling self-destructive behavior and improving patient compliance explicitly with borderline personality disorder (BPD) . Linehan and colleagues (2006) introduced DBT as a unique effective approach in reducing suicide attempts . A study in Germany found using outpatient DBT under routine health care conditions significantly effective in improvement of aggressive behaviours in borderline patients .

In some studies conducted in Iran DBT was effective in: enhancing quality of sleep and reducing anxiety in irritable bowel syndrome (IBS) patients (Mohammadi , Gholamrezaei ,& Azizi, 2015), in emotion regulation and perceived social support in patients with coronary heart disease (Linehan, 1993), in reducing binge and depression among women with binge disorder (Soleimani, Khodavirdi, & Ghasemzadeh, 2014), in reducing expulsive anger and impulsive behaviors in patients referred to Amir Kabir Hospital in Arak (a central province in Iran) (Linehan , Comtois , Murray , Brown , Gallop , Heard , Korslund , Tutek , Reynolds , Lindenboim , 2006), and in irrational believes treatment, depressed prisoners who had antisocial personality disorder in Ilam (a west province in Iran) (Vanden Bosch , Verhuel ,, Schippers , Brink,2002).

Except above mentioned studies, some researches have confirmed DBT effectiveness in decreasing aggression for example Clarkin et al. (2007) concluded that DBT was an effective treatment in soothing anger in borderline personality disorder patients. Soler et al. (2009), Miller et al. (2007) and Vanden Bosch et al. (2002) showed that DBT was effective in reduction of impulsivity, dysregulating emotions, and improving behavioral/emotional problems such as depression, anxiety, anger and emotional instability. As it was told earlier, there were not many studies focusing on efficacy of DBT in reduction of aggression in Iranian adolescents. In any case, findings of present study can be explained in this way: it seems that four components of DBT (basic mindfulness and sustaining distress as acceptance elements and emotion regulation and interpersonal skills as change elements) helped girl adolescents to cope with stressful situations and to regulate their emotions. In addition, it helped participants to less experience negative emotions like anxiety and depression.

This study had some limitations: 1) lack of follow-up, 2) Failure to control of some confounding variables, and 3) small sample size.Given the effectiveness of DBT in reduction of aggression among girl adolescents, we propose integration this intervention with other psychological and life skills interventions for Iranian high school students, is recommended.

#### ACKNOWLEDGEMENT

We thank cooperation of Huda and Rahe Zeinab high schools in Tehran, Iran.

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#### ABSTRACT

Nowadays, school administrators in the Elementary Public Schools in the Philippines are challenged to provide a project that will achieve the Department of Education's goal to have a zero non-reader in all levels. In this study, Silangan Elementary School developed the Trans-SMART program which aimed to determine the pupil-respondents' reading interest via Trans-SMART program using the Strategic Intervention Materials (SIM). TRANS-SMART Program (Transforming Learners through Science, Mathematics and Reading Time Program) is one of the pioneering innovative tools that was formulated by the institution to lessen the problems in relation to pupils who were non-readers. This new innovative tool is an example of remedial teaching. The one group pretest-posttest design was used to find out the effectiveness of the implementation of the program as intervention in enhancing the reading level of struggling readers. The findings revealed that Trans-SMART program was effective. Likewise, most of the pupils obtained high scores in the posttest. There were significant differences in the pretest and posttest results in English, Mathematics and Science after the implementation of the program using Strategic Intervention Materials.

Keywords: effectiveness, interest, innovative, Trans-SMART Program, intervention

#### **INTRODUCTION**

The ability to read has always been viewed as critical and a predictor to academic success (Grabe & Stoller, 2002). Thus, reading instruction should be given emphasis and must be prioritized by a responsible government. In this age of information where orality is not enough to communicate to the world anymore, quality reading instruction among public schools should be a top priority. (*Hyldgaard*,2015). Moreover, reading, to second language learners of English, is the most important skill for foreign language learners because they have little exposure to the target language outside the classroom and most of the information in English comes through reading (Boss, 2002).

Reading literacy is the ability to understand and use those written language forms required by society and/or valued by the individual. Readers can construct meaning from texts in a variety of forms. They read to learn, to participate in communities of readers in school and everyday life, and for enjoyment. And because developing reading literacy ability is vital to every student's growth and maturation, the International Association for the Evaluation of Educational Achievement, more widely known as IEA, has been conducting regular international assessments of reading literacy and the factors associated with its acquisition in countries around the world for more than 50 years. PIRLS (Progress in International Reading Literacy Study) was inaugurated in 2001 as a follow-up to IEA's 1991 Reading Literacy Study. The target population for PIRLS is students in Grade 4, and the mean age at the time of testing is at least 9.5 years. This study is carried out under the auspices of the International Association for the Evaluation of Education of Education of Education of Education of Education of Education of Education for the Evaluation of Educational Achievement (IEA), a consortium of research institutions of 60 countries. (PIRLS 2016).

In the Philippines, the ability to read and write is a priority, so any effort to promote literacy by the government, organizations, or even private individuals is celebrated (Cristobal, 2015). Notably, however, is the alarming rate of the overall, simple literacy rate based from National Statistics Office of the entire country which fell by 0.5 percent from 1994 to 2003, that is, from 93.9 to 93.4 as pointed out by Hyldgaard (2015) and mentioned by Juan Miguel Luz (2007), a former education undersecretary in his article "A Nation of non-readers." He also emphasized that with poor reading comes poor learning. In 2008, the Functional Literacy, Education and Mass Media Survey (FLEMMS) found out that the number of Filipinos, aged 10-64 years old, who do not understand what they read, has grown to 20.1 million (20m Filipinos Can Read but Cannot Understand). Surprisingly, in



2010, a report from the National Statistics Office Census of Population and Housing (CPH) show that of the 71.5 million individuals who are 10 years old and above, 97.5 percent or 69.8 million were literate or could read and write—an increase from the 2000 CPH record of 92.3%. It appears therefore that the literacy rate has risen compared to 10 years ago. (Desiderio, 2013).

The Department of Education (DepEd) and the Department of Science and Technology (DOST) identified the problem on poor reading comprehension as a principal factor in the miserable performance of students in the National Achievement Test (Rimando, 2006) and that DepEd regarded reading comprehension as the single factor which caused frustrations of students to perform better in school achievement tests as studied by Iman (2010) and concluded that reading comprehension is a factor to consider to elevate the academic performance of students. The Department of Education continues to implement the use of Phil-IRI (Philippine Informal Reading Inventory) as an initiative in its thrust to make every Filipino child a reader. It is anchored on the flagship program "*Every Child A Reader Program*" (ECARP), the goal of which is to enable every Filipino child to communicate both in English and Filipino through effective reading instruction. It assesses the reading proficiency levels including word recognition, comprehension and reading speed of elementary school pupils. The reading levels are frustration, instructional, independent, and non-reader.

Public schools in the Philippines like the Silangan Elementary School in Taguig City, was not exempted from this challenging situation of low comprehension level in reading. It was disheartening to see majority of student population to be in the frustration level. Realizing the urgency to address the students' need to learn to read with comprehension, a program was conceptualized and eventually implemented and evaluated, this is the TRANS-SMART program. By the virtue of Republic Act No. 9155, the TRANS-SMART program came into being.

#### The Development of Trans-SMART Program

TRANS-SMART program which is one of the pioneering innovative tools meant to lessen the number of non-readers. This new innovative tool is an example of remedial teaching. The objective of the program is to develop students' reading competence through English as medium of instruction with Math and Science as content. In the program, teachers were tasked to remedially teach these struggling readers once a week for two hours. Teachers were assigned to every grade level and were given two to five pupils to remedially teach for the whole school year.

#### Strategic Intervention Materials (SIM)

In the development of the reading materials, which is the Strategic Intervention Materials or SIM, collaboration among experts and teachers was observed. The expertise of the teachers were maximized, teachers extended their time to finish the materials, willingly extending time until quality circle time. Instead of having quality circle in three hours, it was extended to five hours. The SIM covered lessons/topics based on the Least Mastered Skills (LMS) of the National Achievement Test (NAT) with tests constructed and patterned with the NAT test items. In-service training was conducted for a month, while writing the lessons in modular form. Each teacher was assigned to make modules. Concepts like graphics/illustrations were based on the interest of the learners, while the topics covered in every module were based from the least mastered skills from the previous National Achievement Test. At the end, there were 50 lesson titles for English, 50 for Mathematics and 50 for Science respectively. These parallel skills were presented in stories and colorful pictures and illustrations which captivated the learners' interest. Lessons were arranged from easy, average to difficult. After the completion of each module, it was checked and critiqued by the different school subject coordinators and validated by three district subject coordinators using the LRMDS tools in validating printed materials.

#### The Implementation of Trans-SMART Program

After the SIM materials were tried and evaluated, the implementation of the program followed. The TRANS-SMART Program was launched on September of 2014. These involved pupils in the last two sections of grades 4 to 6, pupils with the lowest score in the comprehension part in the Phil-IRI and the most number of miscues obtained were selected to be part of the program which totaled to 90 pupils. During the remedial sessions, teachers noted the active participation of the pupils especially so that they received free snacks and other incentives in every improvement noticed by the teachers. The materials used with the level of the pupils. On the other hand, parents were happy because of the improved academic performance of their children as evident in the children's report card.



#### Philippine-Informal Reading Inventory (Phil-IRI)

The Philippine-Informal Reading Inventory (Phil-IRI) test is an oral test given to a pupil to measure reading ability. Five test questions are administered constituting the entire test. The reading levels are: *Independent reading level* – Pupil can read with ease and without the help or guidance of a teacher. In the Phil-IRI test, they can answer four or five correct answers (out of five test questions) and can read with rhythm, with a conversational tone, and can interpret punctuation correctly; *Instructional reading level* – Pupil can profit from instruction. In the Phil-IRI test, they answer three out of five test questions correctly; *Frustrated reading level* – Pupil gets two or below in the Phil-IRI test (out of five test questions). They show symptoms or behavior of withdrawing from reading situations and commit multiple types of errors in oral reading.

#### THE STUDY

Remedial education (also known as developmental education, basic skills education, compensatory education, preparatory education, and academic upgrading) is designed to assist students to achieve expected competencies in core academic skills such as literacy and numeracy (Babungo, 2012). According to him, it is a multifaceted approach, tailoring remedial intervention plans to a child's specific needs. It makes use of one-on-one instruction, small group instruction, written work, verbal work and computer-based work. The teacher teaches the lesson in order to help slow learners make up for what they lost in the course of learning. The teacher uses extra hours after school, weekends or holidays. He uses more resources and varies teaching methods. He helps the children to master, retain or remember what they have learned.

The problem lies on the idea that many students today cannot read nor write. There are students that were promoted to the next level that cannot utter a sentence or are able to read. That is the reason why many educators have been viewing the use of remediation in order to alleviate this problem. TRANS-SMART is one of the pioneering innovative tools that were formulated by the Silangan Elementary School to possibly lessen the problem in relation to pupils who were non-readers. TRANS-SMART Program (Transforming Learners through Science, Mathematics and Reading Time Program). This new innovative tool is an example of remedial teaching. The idea behind this program lies on the problem that there were pupils promoted but still struggling in reading English or understanding Mathematics and Science subjects whose medium of instruction is English. The idea in formulation the TRANS-SMART was the poor result of the National Achievement Test and other related examination. In order to alleviate this problem, teachers were task to remedially teach these struggling readers once a week for two hours. Teachers were assigned for every grade level and were given two (2) – five (5) pupils to remedially teach for the whole school year. This study aims to determine the use of TRANS-SMART Program as an effective intervention in promoting reading development among struggling readers.

#### CONCEPTUAL FRAMEWORK OF THE STUDY

This study is anchored on Republic Act 9155 also known as Governance of Basic Education Act of 2015. According to this Act, the school head shall form a team with the school teachers/learning facilitators for delivery of quality educational programs, projects and services. A core of non-teaching staff shall handle the school's administrative, fiscal and auxiliary services. Consistent with the national educational policies, plans and standards, the school heads shall have authority, accountability and responsibility for the following: 1) Setting the mission, vision, goals and objectives of the school; 2) Creating an environment within the school that is conducive to teaching and learning; 3) Implementing the school curriculum and being accountable for higher learning outcomes; 4) Developing the school education program and school improvement plan; 5) Offering educational programs, projects and services which provide equitable opportunities for all learners in the community; 6) Introducing new and innovative modes of instruction to achieve higher learning outcomes; 7) Administering and managing all personnel, physical and fiscal resources of the school; 8) Recommending the staffing complement of the school based on its needs; 9) Encouraging staff development; and 10) Establishing school and community networks and encouraging the active participation of teachers organizations, non-academic personnel of public schools and parents-teachers-community associations. (http://www.gov.ph/2001/08/11/republic-act-no-9155/).

Following the Governance act, the school head/principal developed a school education program and school improvement plan by implementing the TRANS-SMART Program aimed at improving the pupils' reading



comprehension and consequently, the National Achievement Test and Phil-IRI result of Silangan Elementary School. Under the supervision of the principal, the TRANS-SMART program was planned, developed, implemented, and evaluated. The reading materials were developed by teachers and master teachers, while the supervisors for English, Math and Science validated the materials using the Evaluation Rating Sheet for Print Resources from the Department of Education. Research Paradigm is shown in Figure 1.



#### Figure 1: Research Paradigm

As reflected in Figure 1, the Phil-IRI result of Silangan Elementary School was the basis for the development and implementation of the TRANS-SMART program, a remedial reading program for pupils covering three subject areas namely English, Math and Science also called Strategic Intervention Materials (SIM). The effectiveness of the program was tested through a pre-test and post-test while the SIM was evaluated by the teachers using the three criteria which are: Quality of Materials, Implementation Process, and Support of Administration.

#### STATEMENT OF THE PROBLEMS

This study aimed to determine the student-respondents' reading interest via Trans-SMART program using the Strategic Intervention Materials (SIM). Specifically, it answered the following problems:

- 1. What is the pretest and posttest results of the pupil-respondents in the following subjects based on the Strategic Intervention Materials in:
- 1.1. English;

1.2. Mathematics; and

- 1.3. Science?
  - 2. Are there significant differences between the pretest and posttest results in English, Mathematics, and Science of Grades 4, 5, and 6?
  - 3. What is the assessment of the teacher-respondents in the implementation of the Trans-SMART program in terms of:
- 3.1. Quality of materials;
- 3.2. Implementation process; and
- 3.3. Support of the Administration to the Program?

#### METHODOLOGY

The study utilized descriptive-comparative since an intervention program called Trans-SMART Program was used to enhance the least mastered skills in Science, Math and Reading. These were tested using the one-group pretest-posttest design among the student-respondents. The Learning/instructional materials, pretest and posttest used in the study were developed and validated by the district supervisors and master teachers prior to its

administration. There were 300 participants in the TRANS-SMART program from grade one to grade 6. Out of these, 90 pupils were randomly selected from Grade 4 to Grade 6. The selection of the pupils were those recommended for remedial instruction and were enrolled during the school year 2015-2016.

#### FINDINGS

The pretest and posttest results of the pupil-respondents in English, Math and Science subjects
 In English. Table 1 presents the pretest and posttest results of the pupil-respondents in English.

Table	1

Cara da Larad	Pre-Test			Post-Test			
Grade Level	Mean	SD	Interpretation	Mean	SD	Interpretation	
Grade 4	21.6333	2.02541	Average	36.5333	4.50083	High	
Grade 5	20.9667	3.38845	Low	39.6333	1.95613	High	
Grade 6	23.0000	2.14958	Average	40.6000	2.02740	High	
Composite	21.8667	2.52115	Average	38.9222	2.82812	High	

#### Pre-Test and Post-Test Results of Pupil-Respondents in English

Scale: 50-41=Very High; 40-31=High; 30-21=Average; 20-11=Low; 10-0=Very Low

It could be gleaned in Table 1 that the pretest and post test results of pupil-respondents in English subject revealed average and high results accordingly. This showed that posttest results obtained higher mean values compared to the pretest of pupils across Grades 4, 5 and 6. This means that the improvement is very evident after the treatment, that is, the intervention materials must have worked.

**1.2 In Mathematics.** Table 2 presents the pretest and posttest results of the pupil-respondents in Mathematics. **Table 2** 

#### **Pre-Test and Post-Test Results of Pupil-Respondents** in Mathematics

	Pre-Test			Post-Test		
Grade Level	Mean	SD	Interpretation	Mean	SD	Interpretation
Grade 4	19.9667	1.97368	Low	36.6000	4.86791	High
Grade 5	21.0000	2.71649	Average	37.5667	3.59773	High
Grade 6	23.5000	2.11318	Average	39.8000	2.04096	High
Composite	21.4889	2.26778	Average	37.9889	3.50220	High

*Scale:* 50-41=*Very High;* 40-31=*High;* 30-21=*Average;* 20-11=*Low;* 10-0=*Very Low* 

It could be gleaned in Table 2 that the pretest and post test results of pupil-respondents in Mathematics subject revealed average and high results respectively. This showed that posttest results obtained higher mean values compared to the pretest of pupils across Grades 4, 5 and 6. Similar to Table 2, the result clearly indicate the positive effect of the intervention made in Mathematics. A remarkable increase from average to high means that the pupils' performance greatly improved.

**1.3 In Science.** Table 3 presents the pretest and posttest results of the pupil-respondents in Science.



Cue de Level	Pre-Test			Post-Test		
Grade Level	Mean	SD	Interpretation	Mean	SD	Interpretation
Grade 4	21.2000	1.42393	Average	38.0000	3.78746	High
Grade 5	22.4333	2.48698	Average	40.6000	2.07780	High
Grade 6	21.0333	3.33718	Average	40.7667	1.63335	High
Composite	21.5555	2.41603	Average	39.7889	2.49954	High

## Table 3Pre-Test and Post-Test Results of Pupil-Respondents in Science

Scale: 50-41=Very High; 40-31=High; 30-21=Average; 20-11=Low; 10-0=Very Low

It could be gleaned in Table 3 that the pretest and post test results of pupil-respondents in Science subject revealed average and high results correspondingly. This showed that posttest results obtained higher mean values compared to the pretest of pupils across Grades 4, 5 and 6. Similar to the results in English and Math, the higher mean value in the posttest must be because of the reading intervention program.

2. Differences in the pretest and posttest results in English, Mathematics and Science in Grades 4, 5 and 6

**2.1 In English.** Table 4 presents the differences between the pretest and posttest results of pupil-respondents in English.

#### Table 4

#### Differences in the Pre-Test and Post-Test Results

Grade Level	Pre-Test Mean	Post-Test Mean	<b>T-Value</b>	Sig Value	Interpretation
4	21.6333	36.5333	-15.649*	.000	Significant
5	20.9667	39.6333	-28.294*	.000	Significant
6	23.0000	40.6000	-44.320*	.000	Significant
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#### of Pupil-Respondents in English

\*Significant at .05 level of significance

Using Paired T-Test, the pretest and post test results of the pupil respondents in English subject revealed significant differences at 5% level of significance to reject the null hypothesis. It could be concluded that effectiveness of TRANS-SMART program has been realized as form of intervention to raise the level of pupils' performances in English. Negative t-value implied that posttest showed higher mean values than the pretest.

**2.2 In Mathematics.** Table 5 presents the differences between the pretest and posttest results of pupil-respondents in Mathematics.

#### Table 5

Differences in the Pre-Test and Post-Test Results of Pupil-Respondents in Mathematics

Grade Level	Pre-Test	Post-Test	T-Value	Sig Value	Interpretation
Grade Lever	Mean	Mean		big value	merpretation
4	19.9667	36.6000	-18.664	.000	Significant
5	21.0000	37.5667	-18.321	.000	Significant
6	23.5000	39.8000	-33.971	.000	Significant



#### \*Significant at .05 level of significance

Using Paired T-Test, the pretest and post test results of the pupil respondents in Mathematics subject revealed significant differences at 5% level of significance to reject the null hypothesis. It could be deduced that effectiveness of TRANS-SMART program has been realized as form of intervention to raise the level of pupils' performances in Mathematics. Negative t-value implied that posttest showed higher mean values than the pretest.

**2.3 In Science.** Table 6 presents the differences between the pretest and posttest results of pupil-respondents in Science.

#### Table 6

Differences in the Pre-Test and Post-Test Results of Pupil-Respondents in Science

Grade Level	Pre-Test Mean	Post-Test Mean	<b>T-Value</b>	Sig Value	Interpretation
4	21.2000	38.0000	-20.925	.000	Significant
5	22.4333	40.6000	-30.041	.000	Significant
6	21.0333	40.7667	-30.022	.000	Significant

\*Significant at .05 level of significance

Using Paired T-Test, the pretest and post test results of the pupil respondents in Science subject revealed significant differences at 5% level of significance to reject the null hypothesis. It could be inferred that effectiveness of TRANS-SMART program has been realized as form of intervention to raise the level of pupils' performances in Science. Negative t-value implied that posttest showed higher mean values than the pretest.

#### 3. Assessment of the teachers in the implementation of the Trans-SMART program in terms of:

**3.1 Quality of Materials.** Table 7 presents the assessments of the teachers in the implementation of TRANS-SMART program in terms of quality of the materials.

Table 7

#### Teachers' Assessment in the Implementation of

TRANS-SMART Program in terms of

#### **Quality of Materials**

Indicators	Mean	SD	Interpretation
1. The materials used were easy to understand.	3.7667	.43018	Strongly Agree
2. The activities on the materials were sufficient	2 8222	37005	Strongly Agroa
to achieve the competencies needed.	5.6555	.37903	Strongly Agree
3. There were enough materials used during the	3 1667	50742	Strongly Agroa
tutorial sessions.	5.4007	.50742	Strongly Agree
4. The pretest and posttest questions were valid	3 0333	25371	Strongly Agroa
and reliable.	5.7555	.25571	Strongly Agree
Composite	3.7500	.39259	Strongly Agree
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Scale: 4.00-3.26=Strongly Agree; 3.25-2.51=Agree; 2.50-1.76=Disagree; 1.75-1.00=Strongly Disagree

As shown in Table 7, the teachers involved in the implementation of the Trans-SMART were all in agreement strongly in their assessment of the quality of materials they used in the program. It was noteworthy that validity and reliability of the pretest and posttest obtained the highest mean value with homogeneous perceptions of teachers. This could mean that teachers are effective as materials developer of instructional materials; they can produce easy to use, appropriate, sufficient and comprehensive learning materials as evidenced by the mean result and its interpretation of "strongly agree."



**3.2 Implementation Process.** Table 8 presents the assessments of the teachers in the implementation of TRANS-SMART program in terms of the implementation process.

# Table 8Teachers' Assessment in the Implementation ofTRANS-SMART Program in terms ofImplementation Process

Indicators	Mean	SD	Interpretation
1. Participants of the program were properly selected.	3.9333	.25371	Strongly Agree
2. Time allotted during the tutorial sessions was met.	3.9000	.30513	Strongly Agree
3. Participation of the pupils in the program was visible.	3.8667	.34575	Strongly Agree
4. The administration of the pretest and posttest were valid and reliable.	3.8667	.34575	Strongly Agree
Composite	3.8917	.31258	Strongly Agree

Scale: 4.00-3.26=Strongly Agree; 3.25-2.51=Agree; 2.50-1.76=Disagree; 1.75-1.00=Strongly Disagree

As shown in Table 8, the teachers revealed that they strongly agreed in their assessment to the implementation process of the program. Remarkably, the proper selection of participants showed the highest mean value with homogeneous perceptions of teacher-respondents.

**3.3 Support of the Administration to the Program.** Table 9 presents the assessments of the teachers in the implementation of TRANS-SMART program in terms of support of the administration to the program. **Table 9** 

Teachers' Assessment in the Implementation of TRANS-SMART Program in terms of Support of the Administration to the Program

Indicators	Mean	SD	Interpretation
1. The teachers supported the program.	4.0000	.00000	Strongly Agree
2. The teachers were given incentives in the	2 0000	20512	Strongly Agree
implementation.	3.9000	.30313	Subligity Agree
3. The principal/department chair monitored the			
implementation of the program from the	4.0000	.00000	Strongly Agree
beginning to end.			
4. Challenges and problems were discussed and	2 9222	27005	Change alor A succ
given actions at once.	3.8333	.37905	Strongly Agree
Composite	3.9333	.17104	Strongly Agree

Scale: 4.00-3.26=Strongly Agree; 3.25-2.51=Agree; 2.50-1.76=Disagree; 1.75-1.00=Strongly Disagree

As shown in Table 9, the teachers revealed that they strongly agreed in their assessment to the support of administration in implementing the program. Outstandingly, the teachers' support to the program and close monitoring of principal or department chair from the beginning to end had obtained perfect mean values among other indicators which showed that there were no deviations in the respondents' perceptions.

Table 10 presents the summary of teachers' assessment in the implementation of TRANS-SMART program.



## Table 10Summary of Teachers' Assessment in the Implementationof TRANS-SMART Program

Variable	Composite Mean	SD	Interpretation
1. Quality of the Materials	3.7500	.39259	Strongly Agree
2. Implementation Process	3.8917	.31258	Strongly Agree
3. Support of the Administration to the	2 0222	17104	Strongly Agree
Program	5.9555	.1/104	Strongly Agree
Grand Mean	3.8583	.29207	Strongly Agree
00.2.26 9 1.4 2.25 2.51 4	2 50 1 76 D	1 55 1 0	

Scale: 4.00-3.26=Strongly Agree; 3.25-2.51=Agree; 2.50-1.76=Disagree; 1.75-1.00=Strongly Disagree

As shown in Table 10, the overall assessment of teacher-respondents revealed that they strongly agreed in the implementation of TRANS-SMART Program. The support of the administration obtained the highest composite mean value among others. It also showed that respondents' perceptions were homogeneous as evident by the small value of standard deviation.

#### CONCLUSIONS

In the light of these findings, the following conclusions were drawn: The program developed and implemented at Silangan Elementary School was effective; the pupil's respondents were average in their pretest. Likewise, most of the pupils obtained high scores in the posttest; and there were significant differences in the pretest and posttest results in English, Mathematics, and Science after the implementation of the Trans-Smart Program through the use of the Strategic Intervention Materials.

#### RECOMMENDATIONS

In transforming pupils interest via trans-smart program at Silangan Elementary School the following measures are recommended: identify the weaknesses in both pretest and posttest which can serve as inputs in designing the remediation program to address these weaknesses; the use of Trans-Smart Program should be institutionalized at Silangan Elementary School; Explore the effect on influence of other factors of test performance in English, Mathematics, and Science; Faculty training on the implementation of Trans-Smart Program and the materials development in English, Mathematics, and Science should be included in the faculty development program; It can serve as a springboard for teachers to explore new ways of facilitating and enhancing of students' learning; and a replicate study should be conducted in other schools using the same variables focused in this inquiry to lend credence to the significant findings of the study.

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#### 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

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#### 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, 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. 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 ttest 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; Ortlied & Norrris, 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

		Pre-tes	t Scores	Post-test Scores	
Method	Ν	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:



**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	Ν	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 show 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 Ortlied and Norrris (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.

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## Effects of Health Education on Cigaratte Smoking Habits Among Health Professional Students

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#### 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 smokersregular 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 'modarate dependency' ratio was 89.5%, 'the above moderate dependency' ratio was 10.5% In the last grade, 'modarate 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 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.

	Smok	ing Statu	S							
Majors	No sn	noking	Occa	sionally	Regu	Regular			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	X <sup>2</sup> =9,829	
Nursing	85	80,2	13	12,3	8	7,5	106	100	P=0,043	
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 <sup>2</sup> =28,634	
Female	167	80,3	28	13,5	13	6,2	208	100	<b>P=0,000</b>	
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 <sup>2=</sup> 3,381	
Last Grade	43	22,9	14	34,1	9	34,6	66	25,9	P=0,184	
Total	188	100	41	100	26	100	255	100		

## TABLES Table-1: Distribution of students' smoking status by majors, grades and gender

		First Gr	ade	Last G	rade	Total		Significanc	
								У	
		n	%	n	%	n	%		
Did you learn about smoking hazards in your	Yes	38	20,1	58	87,9	96	37,6	X <sup>2</sup> =95,717 P=0,000	
courses?	No	151	79,9	8	12,1	159	62,4		
Did you discuss the reasons for smoking in your	Yes	44	23,3	35	53,0	79	31,0	X <sup>2</sup> =20,248 P=0,000	
courses?	No	145	76,7	31	47	176	69,0		
Didyoudiscusstheimportanceofgettingastoryfromthepatient	Yes	71	37,6	58	87,9	129	50,6	X <sup>2</sup> =49,538 P=0,000	
about tobacco use?	No	118	62,4	8	12,1	126	49,4		
Have practical or theoretical training been given on quitting	Yes	15	7,9	31	47,0	46	18,0	X <sup>2</sup> =50,40 9	
approaches?	No	174	92,1	35	53,0	209	82,0	P=0,000	
Has it been discussed that it is important to provide educational material that	Yes	49	25,9	40	60,6	89	34,9	X <sup>2</sup> =25,895	
cessation?	No	140	74,1	26	39,4	166	65,1	P=0,000	

Table-2: The distribution of smoking status according to having tobacco related education

		First (	Frade	Last Grade		Total	
		n	%	n	%	n	%
	Lung Cancer	184	97,4	65	98,5	249	97,
	Throat Cancer	136	72	52	78,8	188	73,
	Oral Cancer	123	65,1	55	83,3	178	69,
Smoking-	Cardivascular Diseases	123	65,1	48	72,7	171	67,
Disease	Chronic Bronchitis	117	61,9	41	62,1	158	62,
Relationship Cerel Newl	Cerebrovascular Diseases	104	55,0	40	60,6	144	56,
	Newborn Death	85	45,1	32	48,5	117	45,
	Bladder Cancer	59	31,2	29	43,9	88	34.

#### Table-4: The variables that found significance after logistic regression analysis

	<b>B</b> coefficient	Standart Error	<b>Odds Ratio</b>	% 95 Cl	Р
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

	Say1	%
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)

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#### Emotional Intelligence Based Practice, Technology and Curriculum in Malaysian Teacher Education Institute

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#### ABSTRACT

This paper discusses the concept of emotional intelligence indicators that constitute crucial elements for a teacher trainer at the Malaysian Teacher Education Institute (MTEI). Emotional intelligence is the ability of individuals to understand your feelings, empathize with the feelings of others and regulate emotions themselves. Emotional intelligence as a set of skills that are involved with the ability to monitor feelings themselves, the feelings of others, to distinguish them and use this information to help a person think and act. Teachers can use emotional intelligence in their daily lives in the MTEI. Teachers need to socialize with other peers, attend lectures, assignments either individually or collectively. Some researchers found that emotional intelligence affects academic achievement. In addition, high emotional intelligence can affect the appearance of teachers as more healthy, succeed academically, have a strong personal relationship with those around him, is more sensitive in assessing others, have empathy towards others and excel in interpersonal skills. Thus, emotional intelligence needed by teachers in MTEI to enjoy a better life. In addition, the trainees also get practical training such as School Based Experience (PBS), practicum and internship. This training provides trainees to actual experience as a teacher at the school. Students will be exposed to practical preparation of daily lesson plans, preparation of questions, marking students' work, performing administrative duties and clerical, control classes, various student and became a substitute teacher. If teachers lack emotional intelligence, some symptoms such as stress, emotional disturbances, rebellion and anger will occur. Therefore, only teachers with high emotional intelligence can through these challenges well. Findings showed that the elements of self-management, self-awareness, social skills and social awareness are elements of emotional intelligence needed by trainees from the perception of lecturers. This finding is in line with recommendations by some emotional intelligence experts (Goleman, 1998 & Brackett et al., 2010). Multiple regression analysis of technology, practice and curriculum was conducted to see the contribution of the variables to emotional intelligence. Findings showed that the element of curriculum needed by trainees from the perception of lecturers. Hipotesis also discuss in this analysis. Exercise significant element of the perception of lecturers needed to improve emotional intelligence is the curriculum meanwhile practical and technology is not significant for improving trainees emotional intelligence. Keywords: Trainee Teacher, Emotional Intelligence and Training in MTEI

#### **INTRODUCTION**

Teachers with academic qualification is not enough to follow lessons and training at MTEI. Some researchers have suggested skills such as hard skills, soft skills, competitive skills and employability skills to produce workforce competent (Agbola & Lambert, 2010; Abd Hadi, 2008; Buntat, Saud & Ab Rahman, 2008; Ismail, 2008). However, the skills that otherwise must be accompanied by emotional intelligence to consolidate. Elements of emotional intelligence such as self-awareness, confidence, trust, be adaptable, committed, motivated, can control yourself, realize emotions, empathy, political awareness, communication, leadership, managing conflict need to be mastered before to master skills others (Brackett et al., 2010; Akerjordet & Severinsson, 2008). Thus emotional intelligence are vital to trainees before mastering the skills of the work of others. These facts point to elements of emotional intelligence. Disadvantages faced by trainees can be overcome during training at MTEI again.



Nurturing emotional intelligence can form teachers who have social skills and personal skills is high (Marzuki & Don, 2007). Therefore, the role of emotional intelligence in the formation and training of trainee teachers is something that should be reviewed and expanded through research.

#### PROBLEM BACKGROUND

MTEI is a teacher training center that produces the bulk of the country's teachers. According to the statistics of national education in the higher education sector in 2013, a total of 12,621 graduates in the field of education have been produced in which 50 percent of graduates have been produced from 27 MTEI throughout Malaysia (Ministry of Education, 2014). The number of post-MTEI is immense and needs to be addressed in realizing the national aspirations as contained in the National Education Philosophy and Philosophy of Teacher Education. Past studies have found less emotional intelligence trainee teachers during their teacher training at MTEI. Asri Atjeng (2008), said the training program is being practiced in less successful teacher education institutions to educate teachers to excel. In addition, in some other aspects of emotional intelligence found teachers did not master the skills to resolve conflicts and listening skills, as opposed to face to face communication (Noordin, 2009). Razlan (2011) found that teachers lack social skills and leadership qualities. According to him, although there are elements of leadership in the subjects of management and leadership in the MTEI, most subjects are more theories. He proposed that the MTEI leadership practically implement the concept so that trainees can apply during teaching practice in schools. Abroad, there training programs in their curricula do not improve emotional intelligence coach produced. Cherniss et al., (1998) in the study found that most of the principal training center recognized the necessity of emotional intelligence in the work but did not act to include the measure of emotional intelligence in their training program. He added that this matter because the principal training center coaches felt that the training center has grown and emotional intelligence has been formed before entering the training center.

As a result, the training centers there just provide skilled trainers in the field of theory and practical but at the same time does not apply emotional intelligence increases during the training period that followed. This finding is in line with the views of principals in the study Cherniss et al., (1998), the coach who enters training center has had a good emotional intelligence. By contrast, in Malaysia, SPM school leavers applying for university courses available, especially in the aspect of emotional intelligence, self-awareness, self-management and social skills is simple. Next, when emotional intelligence is enhanced trainees at the institute, teachers are not brilliant emotional intelligence. Actually, the teacher trainers who have emotional intelligence can function as a teacher during the practicum. They do not have to be deployed, advised, guided and assisted in the performance of duties as directed by the teachers at the school (Abdullah, *et al.*, 2008; Ahmad 2008a). Teachers with emotional intelligence have to perform the role and tasks efficiently, independent, viable and capable of making the right decisions, especially in the process of teaching and learning in the classroom.

#### PROBLEM STATEMENT

Trainees who were lack emotional intelligence lead to less ability to monitor their sense of self, other people's feelings, distinguish between them and use this information to help a person think and act. It will cause bad effects on the character formation of teachers and in turn affect the work they will be doing. Teacher training is also less emphasis on emotional intelligence needs of trainees. Therefore, researchers wanted to identify whether there is a significant contribution of emotional intelligence training to teachers in MTEI. These findings will be used to develop and validate a framework of direct and indirect contribution of training (practice, technology and curriculum) to the emotional intelligence of teachers in the MTEI.

#### **RESEARCH OBJECTIVE**

There are some specific objectives. Among them are:

- i. Identify certainly elements of emotional intelligence required by perception of MTEI lecturers.
- ii. Identify defined contribution practice (practice, technology and curriculum) on emotional intelligence.

#### **RESEARCH QUESTION**

There are several research questions. Among them are:

- i. What certainly elements of emotional intelligence required by the perception of lecturers MTEI?
- ii. How defined contribution practice (practical, technology and curriculum) on emotional intelligence?



#### **RESEARCH INTERESTS**

The study can help lecturers to identify their training teachers emotional intelligence. The information obtained can help lecturers develop the potential of self-awareness, self-management, social awareness and social skills during the MTEI. When placed next to the school, these training teachers can excel academically and emotional intelligence. In addition, the determination in building a future career can also be used as a guideline for training teachers before entering the teaching profession. The findings of this study can give MTEI opportunity to identify their emotional intelligence trainees. This study can help the MTEI in applying the provisions to increase emotional intelligence of students. The MTEI can also plan in-service courses to improve the skills of the lecturers in the use of emotional intelligence in assignments, projects that practical trainees. Indirectly, this assessment can help the MTEI general and our country in particular to produce a quality teacher in line with Vision 2020. In producing teachers with towering and authoritative in the field of education, teachers need to know and understand the elements of emotional intelligence.

#### STUDY LIMITATIONS

The result is highly dependent on the honesty of the respondents, namely the lecturers during responded to the questionnaire. Restrictions also apply when the targeted respondent is not obtained at the time the study was conducted for acting outside the study.

#### **SCOPE OF THE RESEARCH**

The study was conducted in five out of twenty seven MTEI nationwide. Selection is based solely concerned MTEI offering and have training teachers who take the program PISMP RBT option. MTEI involved were MTEI Temenggong Ibrahim, MTEI Kampus Tun Hussein Onn, MTEI Kampus Sultan Mizan, MTEI Kampus Perlis and MTEI Kampus Keningau. In addition, the relationship between emotional intelligence are taken into account in this study was limited to elements of emotional intelligence in this instrument.

#### **CONCEPT FRAMEWORK**

The conceptual framework of this study show the role of emotional intelligence training form teachers. In this study, the role of training is on the elements of pedagogy, practice, technology and curriculum as in Figure 1.1 (Smith, Nemser & McIntyre, 2008).



Figure 1.1: Framework Concept Study

In Figure 1.1, the researcher will seek a review of the needs of emotional intelligence existing teachers in MTEI through questionnaires. In addition, researchers will also get elements of training of respondents readings and expert opinions. The document is the guide books, the National Education Philosophy, Philosophy of Teacher Education, Annual Report of the MTEI and the Malaysia Education Blueprint 2013-2025.

The conceptual framework that is built reflects the independent variables as emotional intelligence and the dependent variable is the training. Researchers expect the correlation between the independent variables and the dependent variable selected. PISMP program trainees who have taken the RBT and lecturer in MTEI main respondents to the perceptions of teachers and lecturers perception of the contribution of independent variables



selected to increase the level of mastery and understanding of emotional intelligence trainees. The effect of demographic factors on the aspect of gender and academic achievement was associated in this study.

#### FINDINGS

Analysis showed that the element of self-management, self-awareness, social skills and social awareness are elements of emotional intelligence needed by trainees from the perception of lecturers. The social skills has a means of 4.50, self-management has a means of 4.49, self-awareness has a means of 4.48 and social awareness has a means of 4.47 as in Table 1.

Element	Means
Self-management	4.49
Self-awareness	4.48
Social skills	4.50
Social awareness	4.47
Total means	4.49

<b>Table 1: Elements</b>	of emotional int	telligence red	quired by po	erception of	f lecturers MTEI
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Regression analysis of practical and technological to the emotional intelligence of lecturer's perception showed forecasters practice ( $\beta = 0.516$ , t (58) = 4.361, p <0.05) and technology ( $\beta = 0.244$ , t (58) = 2,062, p <0.05) is contributing significantly to the overall emotional intelligence for the respondents of lecturer's perception. The results of the analysis also found elements of the technology is the dominant predictor than practical, accounting for 42.3% (r = 0.650) changes in variance with emotional intelligence [F (2,55) = 41,055, p <0.05] as shown in Table 2.

#### Table 2: Multiple Regression Analysis of Practice and Technology towards Emotional Intelligence Based on MTEI Lecturer Perception

Variable	β	Т	р
Practice	0.516	4.361	0.000
Technology	0.244	2.062	0.044

Information:

*p<0.05	*p<0.05
R = 0.650	R = 0.681
$R^2 = 0.423$	$R^2 = 0.464$
$AR^2 = 0.413$	$AR^2 = 0.445$
F = 41.055 (Practice)	F = 23.846 (Technology)
P = 0.000	P = 0.044

Therefore, the null hypothesis stating that there is no significant contribution between the practical and technological variables on emotional intelligence from lecturer's perception is rejected. Results showed that the two variables is a good contributor to emotional intelligence.

Regression analysis of practical and curriculum to the emotional intelligence based on lecturer's perception showed forecasters practice ( $\beta = 0294$ , t (58) = 1.917, p> 0.05) and curriculum ( $\beta = 0.455$ , t (58) = 2,969, p <0.05). This shows a significant predictor of the curriculum contribute to emotional intelligence for the entire respondents. The results of the analysis also found elements of the curriculum is the dominant predictor, accounting for 50.3% (r = 0.709) changes in variance with emotional intelligence [F (1,56) = 27.500, p <0.05] as Table 3.

## Table 3: Multiple Regression Analysis of Practice and Curriculum on Emotional Intelligence Based on MTEI Lecturer's Perception

Variable	β	t	р
Practice	0.294	1.917	0.060
Curriculum	0.455	2.969	0.040



Information:

\*p < 0.05 R = 0.709  $R^2 = 0.503$   $AR^2 = 0.485$  F = 27.800 (Curriculum) P = 0.000

Therefore, the null hypothesis of the perception lecturers stating that there were no significant contribution of variables curriculum and hands-on emotional intelligence is denied. The null hypothesis of the perception of lecturers who stated that there were no significant contributions of variables curriculum of emotional intelligence is denied when there is a significant contribution of the variable practice of emotional intelligence perceived by respondents of lecturers also welcome. Results showed that the curriculum is a good contributor to emotional intelligence.

Multiple regression analysis of technology and curriculum to the emotional intelligence on lecturer's perception showed curriculum predictor ( $\beta = 0598$ , t (58) = 4,596, p <0.05) were significantly contribute to emotional intelligence for the entire respondents. The results of the analysis also found elements of the curriculum is the dominant predictor, accounting for 47.9% (r = 0.692) changes in variance with emotional intelligence [F (1,56) = 25,301, p <0.05] as shown in Table 4.

#### Table 4: Multiple Regression Analysis of Technology and Curriculum to the Emotional Intelligence Based on MTEI Lecturer's Perception

Variable	β	t	р
Curriculum	0.598	4.596	0.000
Technology	0.132	1.011	0.316

Information:

\*p < 0.05 R = 0.692  $R^2 = 0.479$   $AR^2 = 0.460$  F = 25.301 (Curriculum) P = 0.000

Therefore, the null hypothesis of the perception of lecturers who stated that there were no significant contributions between curriculum and technology variables of emotional intelligence is denied. The null hypothesis of the perception of lecturers who stated that there were no significant contributions of variables curriculum of emotional intelligence is denied when there is a significant contribution of technology to the variables emotional intelligence perceived by respondents of lecturers also welcome. Results showed that the curriculum and technology is a good contributor to the perception of emotional intelligence of teachers while only variables curriculum alone is a good contributor to the emotional intelligence of perception lecturer.

Regression analysis of the practical, technological and curriculum of emotional intelligence based on lecturer's perception showed forecasters curriculum ( $\beta = 0.385$ , t (58) = 2.246, p < 0.05) is contributing significantly to the emotional intelligence, while forecasters practice ( $\beta = 0.284$ , t (58) = 1,849, p> 0.05) and curriculum ( $\beta = 0.385$ , t (58) = 2.246, p > 0.05) was found not contribute significantly to the overall emotional intelligence for the respondents of lecturers perception. The results of the analysis also found elements of the curriculum is the dominant predictor, accounting for 51.0% (r = 0.714) changes in variance with emotional intelligence [F (1,56) = 18,748, p < 0.05] as shown in Table 5.



Variable	β	t	р
Curriculum	0.385	2.246	0.029
Technology	0.116	0.908	0.368
Practice	0.284	1.849	0.070

#### Table 5: Multiple Regression Analysis of Practice, Technology and Curriculum to the Emotional Intelligence Based on MTEI Lecturer's Perception

Information:

\*p < 0.05 R = 0.714  $R^2 = 0.510$   $AR^2 = 0.483$  F = 18.748 (Curriculum) P = 0.000

Therefore, the null hypothesis of the perception of lecturers stating that there were no significant contribution of the variable practice, technology and curriculum of emotional intelligence is denied. The null hypothesis of the perception of lecturers who stated that there were no significant contributions of variables curriculum of emotional intelligence is denied when there is a significant contribution between the practical and technological variables on emotional intelligence perceived by respondents of lecturers also welcome. Results showed that the curriculum, practice and technology is a good contributor to the perception of emotional intelligence of lecturers while only variables curriculum is a good contributor to the emotional intelligence of perception lecturer. Therefore, the ministry had to take the initiative in improving the curriculum for improving emotional intelligence trainees.

#### DISCUSSION

In this study, elements of emotional intelligence mean are high. Social skills are an element of the highest, followed by self-management, self-awareness and social awareness. This finding is consistent with several studies conducted by Noordin (2009) who found a higher share of social skills among university students. But the order is a little different, which is followed by self-management, social awareness and self-awareness. In accordance with it, nurturing emotional intelligence can form can form teachers who have high social skills and personal skills. This finding is in line with recommendations by some emotional intelligence experts such as Goleman (1998) and Brackett et al., (2010).

Analysis of regression elements of the technology, the practical and the emotional intelligence curriculum was conducted to see the contribution of the variables. Multiple regressions was used to look at the contribution of variable practice, technology, and curriculum of emotional intelligence. There are several findings based on the selection of several variables on emotional intelligence.

Research showed between variables practice and technology of emotional intelligence found the practice and technology contributes significantly to emotional intelligence. Contribute variables practice and curriculum of emotional intelligence found the curriculum contribute significantly to emotional intelligence and the practice does not contribute significantly to emotional intelligence. Variables contribution technology and curriculum of emotional intelligence found the curriculum contribute significantly to emotional intelligence and technologies do not contribute significantly to emotional intelligence. The researchers also conducted a multiple regression of the contribute significantly to emotional intelligence and technology and curriculum contribute significantly to emotional intelligence and technology while the practice does not contribute significantly to emotional intelligence.

This study was conducted regression to find the contribution of variables practice, curriculum and technology on emotional intelligence by MTEI's lecturer. The findings showed that there are contributions variable practice and technology of emotional intelligence. Analysis on practice and curriculum on emotional intelligence found that only curriculum contribute to emotional intelligence while practices have no relationship with emotional intelligence.



This variable can improve emotional intelligence. This finding is consistent with Buntat et al., (2008) in his study of private training institute lecturers who found practice to improve motor hand skills while using internet technology to increase skills and software. These skills increase the intelligence of their trainees. Abdullah et al. (2008) support the findings and found a correlation with the attitude of the end years teacher training college students. Asri Atjeng (2008) find that practical teacher training increase the confidence level in the aspect of self-management and self-awareness.

Cherniss et al., (1998) related emotional intelligence to improve job performance. Marzuki and Don (2007) findings that emotional intelligence form an effective schools. Noordin (2009) find social skills improve mastery of the subject in the training center. Razlan (2011) said the practical teacher training in school enhance the potential to improve social skills and self-management. In conclusion, practice, technology and curriculum affect the emotional intelligence.

#### CONCLUSION

MTEI role is to train teachers to teach in schools. Teachers are ready academically able to teach and explain the subject well, while teachers with emotional intelligence also have good interpersonal and intrapersonal. Therefore, teacher training needs to be developed in the form of excellent teachers in line with the Malaysia philosophy of education.

#### ACKNOWLEDGEMENT

This study was supported by Fundamental Research Grants Scheme (FRGS) vot 1555, Universiti Tun Hussein Onn Malaysia.

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## Empirical Research Based Learning to Engage Students in an Online Course in Pprogram Evaluation in Pedagogy

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#### ABSTRACT

Our purpose in this project is to design a learning course, online, centered in develop professional competencies on the subject of Program Evaluation, together with lifelong learning competencies, offering students motivational questions on theory and practical activities related to the theory in a progressive sequence along the course. Using evaluation research methodology we have analyzed the students and teacher behaviors in the online course, students achievement and satisfaction with the instructional design and their learning, by means of a survey and the Evaluation from the Institutional Quality Assurance System. The results based in the study of three cohorts, shown improvements in student's participation in the debates in forum, in achievement, and in satisfaction with the learning design. Our purpose to develop competencies for professional and lifelong learning, online, included in the curriculum academic, based on an instructional design that attends personal needs, collaborative learning and formative feedback got good results. We recommend their use to teach similar online courses.

**Keywords**: Online learning, Learning design, Performance-centered learning, Professional competencies, Lifelong learning competencies, Quality evaluation

#### INTRODUCTION

Internet represents a medium through which universities may deliver grades, masters and doctorates courses for students who need to study at a distance and for all who need to actualize their studies and training to improve in their profession and in their lives, without any restriction of time, geographical situation or topics area. The success of this learning modality rests on their instructional designs, learners need and motivation and teachers involvement.

Students in Higher Education usually acquire considerable knowledge and many separate skills, but they rarely learn how to integrate them into performance of complex tasks. Students should learn professional competences where complex tasks could be performed as integrated units, as well as key competencies for lifelong learning to be updated for their personal and professional development (Janssen-Noordman et al. 2006, p. 447). For this reason they have to receive training for application of research skills, develop and evaluate projects, take decision and find solutions to problems that they should prove.

This is done as complementary training of conceptual and procedural contents, and it also contributes to the development of students' autonomous learning, and their ability to analyze and select relevant information, and experiment with their own solutions. It is a new way of learning. Through application you learn how to perform the task. The task resolution is a motivational element that creates the need to understand the fundamentals that underlie the task. The use of a learning design, internet-based, for theory and task learning, helps students to develop their ability to organize their own learning, as it is one important characteristic for lifelong learning (LLL) together to have a positive disposition to learn, the ability to regulate one's own cognitive processes, and to have a positive attitude towards collaborative work, which is necessary for solving complex tasks and problems.

To address these questions, our learning design pay special priority both, theory and educational practices, placing the higher-level of the Bloom taxonomy objectives to get our goals (Bloom, Engelhart, Furst, Hill & Krathwohl, 1956), awaking in students' higher expectation on learning, requiring adequate teacher support and feedback, as well as peers collaboration.


### THE INSTRUCTIONAL COURSE DESIGN CHARACTERISTICS

The instructional course design, based in the principles of Gagné (Gagné, Briggs &Wager, 1988) and Merrill (2008), in synthesis are the following:

We build our instructional project based in the previous theoretical framework on the *Instructional course design* of Gagné (Gagné, Briggs &Wager, 1988) together to the *First principles of instruction* of Merrill (2008), identifying necessary conditions (strategies) for effective, efficient and engaging instruction for information-about, parts-of, kinds-of, how-to and what-happens instructional outcomes, with learning strategies as *Questioning by the teacher to guide learning*, implementation of continue *Formative evaluation and feedback by teachers and peers* and key competencies development for lifelong learning applied along the academic curriculum in one subject content of 'Program Evaluation' belongs of Pedagogy Degree in the Spanish University for Distance Education, which teach online to deliver their university programs.

The web page of the course on 'Program Evaluation' presents the 'work plan' and includes the 'Student Learning Guide', with the course syllabus affirming the goals that are expected to get at the end of the instructional process which are crucial for students to be a professional. (Figure 1).



Figure 1. Main page in 'Evaluación de Programas' virtual course.

In the same main web page of the course it is presented the mandatory works supported by specific guidance and rubric evaluation. An also is presented the Syllabus, with every topics, with links to a web-conference recorded by the teacher, along the course, together a wide variety of instructional supports, and links to the correspondent forum on to debate on key questions on theory and its application into practice.

#### Professional and Lifelong learning competences

*A professional competence* is defined as meaningful whole tasks that are performed in professional practice, and requires integration of knowledge, skills and attitudes. *It says is competent* who possesses the ability to do something efficiently and to meet complex demands in a particular context, through knowledge, cognitive skills, practical skills, as well as social and behavior components such as attitudes, emotions, values and motivations. (Gonczi, 2003). Competency emphasizes a stronger relation between practical and theoretical knowledge, and the contribution of personal and social qualities to task performance (Brockmann et al. 2008, in Fastre et al. 2014, p. 972).

*Eliciting the performance.* Practices related to the key theoretical questions and its relation with the real issues contextualized, together to provide opportunities to practice on the competencies being taught and giving feedback, is an adequate way to elicit performance. The practices following the principles of problem-solving instruction, based in the following elements (Merrill, 2008):

- *The problem* to be solved is framed in the real-world context. It is facilitated a successive progression of problems rather than a single problem.
- The task must activate the student's relevant prior knowledge and experience, and students should be guided to use the new knowledge.
- The final work in the course should be guided to ensure the student demonstrate what have to learn by means of examples rather than merely telling information, pointing out relevant information, providing multiple representations of information and demonstrating explicit comparisons.
- The student must have opportunities to practice and apply the knowledge and skills acquired to solve problems. And the practices must be consistent with the stated or implied objectives.
- The course should provide techniques that help the student integrate and transfer their new knowledge and skills to professional situations, by means of opportunities to reflect, discuss and defend their new knowledge and skills.

Lifelong learning competencies play an important role to fulfill the profession-oriented goals in Higher Education in the European Union. Accordingly, the Qualification Framework in the European Higher Education Area outcomes recognizes: *To have developed those learning skills that are necessary for them to identify their own training need to continue to undertake further study with a high autonomy degree.* (EUC, QFEHEA, 2009).

*Lifelong learning* (LLL) is regarded as an important strategy to improve human development, with a growing interest related to employability, as well as an important learning output of the Educational Systems in Europe and the entire world. (Moos and Gray, 2013). LLL competencies in today's knowledge society require specific key competencies, such as knowing what one has to learn, knowing what one does not know, and knowing where to find relevant information. Because of the increasing amount and the changing nature of knowledge, the need to keep up with change is even more critical today, (Martinez-Mediano & Lord, 2012).

Thus, Professors should be involved in the professional and LLL competencies development to reduce the gap between young people's training and job Demands. And, with this purpose, our instruccional design is focused in developing professional and lifelong learning competencies embedded in the academic curriculum, on line. Prepare students as professional requires preparing them for Lifelong learning.

### Learning guidance by teachers questioning, formative assessment and feedback

Asking key questions on theory and its application in real contexts, enhancing reflection on leaning and self-regulated learners.

Formative assessment is defined as "a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes" (Council of Chief State School Officers, 2008, p. 3). Formative assessment (FA) is part of the instructional design, but takes special relevance in the project here described. FA refers to assessment that is specifically intended to generate feedback on performance to improve and accelerate learning (Sadler, 1998).

In higher education, formative assessment and feedback should be used to empower students as self-regulated learners. The construct of self-regulation refers to the degree to which students can regulate aspects of their thinking, motivation and behavior during learning (Pintrich & Zusho, 2002). In practice, self-regulation is manifested in the active monitoring and regulation of a number of different learning processes, e.g. the setting of, and orientation towards, learning goals; the strategies used to achieve goals; the management of resources; the effort exerted; reactions to external feedback; the outcomes produced. (Nicol and Macfarlane-Dick, 2006, p.199). Formative assessment involves four assessment activities -clarifying learning expectations (goals), collecting information, interpreting information, and acting on/using information collected to move students closer to the learning goals.

In the Virtual & Personal Learning Environment, there is a Forum of Theory for each topic in the syllabus.

The teacher introduces questions to drive learning and generate debate and collaboration, promoting deep learning, centered in theory understanding and its relation with every part of the global practice.

In the Forum to guide the Practical work:

Students are encouraged to present their proposal to evaluate a real educational program. It is recommended the program chosen was familiar to the student.



All receive formative feedback individually, open to all students, grouping the answers when it is possible.

The design of the course, the web-conference on every topic, the learning guided by question in the forum, the script to do the work, benefits to all students enrolled in the course. The participation in the forum benefits students for theirs directs involvement in the debates, to the others because the reading promotes reflection. To those presented in the ordinary call and those who do it in September and read they in summer to follow the discussions in the virtual course as a personal learning environment. The examination is done by essay evaluation, in which the contents of theory and their application in educational real contexts are evaluated.

The Virtual & Personal Learning Environment Network is key to personal and professional development of students, taking advantage of the wealth of network communication, to reflect on key theoretical issues and their relationship with practice, to show examples, share experiences, consult multiple learning resources and update information. The online learning has the challenge of creating learning environments that help students build networks that allow them to integrate knowledge, skills and attitudes of collaboration, respect, commitment and responsibility.

### **RESEARCH METHODOLOGY**

Innovation based in Science Learning should be tested in order to check if the innovation obtains more effective, efficacy, satisfactory, and enjoyable learning. According with the idea to benefit student education, teacher should receive feedback from their students. In this section we show the procedures following to address this premise.

#### The innovation and the research objectives

The innovation consisted in a "Learning design, performance centered, in a Virtual & Personal Learning Environment Network, guided by key questions enhancing collaborative learning and formative feedback" to enhance learning motivation and competencies to program evaluation and lifelong learning".

The main objective of the project is "to evaluate the learning design, its implementation, and their results, to test if it has success in getting the intended goals, to gather arguments to improve the course, and make recommendations".

### **Research design**

The research design belongs to the evaluative research that uses a mixed methods approach. We analyse three students' cohorts, from the following courses:

- 2013-2014: The course first time in the Grade. Enrolled: 120.
- 2014-2015: The innovation was implemented. Enrolled: 279.
- 2015-2016: The innovation was improved. Enrolled: 324.

We use survey techniques to collect information from the course users, the students, and also compare the students' final mark obtained in the year we applied the innovation, with the obtained a year before, together to the students achievement and information collected by the Institutional Quality Assurance System on the course.

- The indicators and procedures followed to measure the results of the innovation are the following:
- The teacher and students behavior in the Forum (Platform statistics).
- The achievement: Comparison between students' final mark in the base-year, the year we applied the innovation, and the following year to check if the innovation is consolidated and sustainable (2013-2014, 2014-2015, 2015-2016. (ANOVA).
- The course evaluation by students the course which the innovation was applied, 2014-205 (Survey).
- The course evaluation in the three academic years, 2013-2014, and 2015-2016, by the UNED Internal Quality Assurance System (IQAS).



## FINDINGS

# Teacher and students' behavior in the Forum

The data in participation in the virtual course are in table 1.

Table 1. Key questions, students	' participation and teacher feedback in the Forum
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Forum	2013-	2014 (1	20)	2014-2015 (279)			2015-2016 (323)		
	KQ	SP	TF	KQ	SP	TF	KQ	SP	TF
1. General questions	23	56	29	36	112	38	15	62	16
2. The practical work	6	10	8	40	102	40	57	141	79
Total participation in Forum 2	24			182 (x7	'.5)		277 (x	:11)	
The theory on the syllabus:									
3. Concepts and Functions of P.E.	15	69	32	6	160	14	9	121	15
4. Evaluative Theories of Scriven	4	18	13	8	112	12	5	31	3
5. The CIPP Model of Stufflebeam	3	9	7	5	86	14	11	56	15
6. The Educational P.E. of Pérez Juste	3	9	10	4	96	19	8	36	21
7. Procedures to realizes P.E.	8	24	18	4	86	8	7	21	11
8. The Program Evaluation Standards	3	13	4	5	75	9	5	22	8
9. Techniques and Instrument to P.E.	2	3	4	3	8	4	2	6	5
Total	42	145	88	35	623	80	47	293	68
Total participation Theory forum 3-9	403			1106 (x3)		788 (x2)			

KQ = Key Questions; SP = Students Participation; TF = Teacher Feedback. P.E.= Program Evaluation. Font: Statistics from the virtual course.

The students enrolled have been increasing since the first course in 232 % and 270% respectively. The key questions, the students' participation and the number of teacher participation to give the formative evaluation and feedback, also are higher in the year that innovation was implemented. In the course 2015-2016 the Innovation was maintained. It is remarkable the increase of the key issues in the forum on the practical work on the course that innovation was introduced, 2014-15, and it was increased in the course 2015-2016, as well as student participation and teacher feedback.

The forum is an excellent learning resource, for the students participating and also for those silent and invisible ones.

## Students' achievement

Regarding the students achievement, their results in the three years are showed in table 2.

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	2013-14 (enrolled 120)				2014-15 (279)				2015-16 (324)			
	June		Septem	lber	June		Septen	nber	June		Septen	nber
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Presented	70	58.33	36	56.25	155	55.55	61	39.95	207	63.89	68	20.99
Pass	46	62.16	24	66.67	124	80.52	47	77.05	165	81.16	54	79.41
Mean	5.84		6.11		6.99		6.56		6.99		6.98	

**Table 2.** Descriptive. The achievement. Final mark (in mean, range 1-10, pass from 5)

Freq.: Frequency. Font: Institutional Statistics. Scores application.

From the information in the table 2, it is worth to note the following results:

- The number of students' enrolled has been considerably incremented.
- The percentage of presented in June 2015-2016 is higher than in the previous course in 8.34 percentage points.



The percentage of approved to the first is higher in 2014-2015 and 2015-2016.

Comparing the students' scores in June in the three courses, the ANOVA result gives statistically significant differences to favor of the courses 2014-2015 y 2015-2016 against the course 2013-2014 (F=8,509, p=0,001 and p=0,000 respectively).

The results confirm the objective pretended with the Instructional Design, centered in performance, guided by theory questions, and a practical work, enhance collaboration and formative evaluation and feedback in the forum, in a Virtual & Personal Learning environment, in the aLF platform in the UNED.

## Students satisfaction on the course

The evaluation of the course, in which the innovation was implemented (2014-2015), was made by means of a questionnaire integrated by 29 items, Likert scaled, from 1 to 5. The sample invited to answer the survey were all the students enrolled, 279, in 2014-15. The sample participants were of 35. The results are showed in table 3.

Tabl	e 3. The five blocks in the Course Evaluation Questionn	aire.		
	The five blocks in the Questionnaire (1-5 Likert)	Items	Mean	St. Dv.
	The virtual course design	6	4.60	0.12
	The questions for learning, in forum	6	4.65	0.04
	The competencies for lifelong learning	4	4.47	0.13
	Prepare student to performance practice	7	4.80	0.07
	Develop generic competencies related to LLL	6	4.56	0.18
	Total	29	4.63	0.109

N= 35. Course 2014-2015. (Reliability by Cronbach Alpha: 0.95).

Font: Questionnaire elaborated by the teacher.

The mean in the questionnaire was 4.63 over 5. The items best evaluated in the course were the practical work, the forum structure, and the professor presence. Summarizing the students' evaluation on the course, it is worth to note the following results:

- The high agreement degree with the questions presented, which show a good conformance and satisfaction with . the innovation.
- The part best evaluated in the questionnaire was the referred to the practical work.
- The orientation in the forum was also well evaluated.
- The competencies development for lifelong learning has been also well evaluated, with a mean of 4.47 over 5.

### Evaluation results from the Institution's Quality Assurance System

The course is evaluated every year by means of the Institution's Quality Assurance System by mans of a questionnaire, which reports the following results (Table 4):

Table 4. The Institution's Quality Assurance System Questionnaire (2015-2016).

Evaluation Questionnaire on the course. ITEMS	%
The previous knowledge in the subject	100
The student Learning Guide	96.43
The learning material impressed	96.43
The complementary learning material in the virtual course	100
The activities in the virtual course	100
The structure of the virtual course	100
The teachers team behavior in the virtual course	100
The students involvement in the virtual course and its importance to prepare the subject	92.59
The information facilitated by the teachers team on the final evaluation	96.43
The continue assessment in the virtual course	92.59
The final exam	92.86
Personal satisfaction with the learning material	96.30
Personal satisfaction with the teachers team	100



Personal satisfaction with the evaluation system.	92.86
Personal satisfaction with the learned in the subject matter	100
N= 28. Mean in %	97.6

The evaluation results on the course, with a participation of 28 students, show a better valuation on the course objectives and its implementation.

The graphic shows the course results according to the students' evaluation in 2015-2016, and its relationship to the average in the Grade, the maximum and the minimum (Figure 2):



Figure 2. Evaluation of the Subject by stuents. Course 2015-2016. N= 28. Mark: 97.6 in %. Font: https://app.uned.es/evacal/questgen.aspx?cu=2016&tecp=6302&ca=63024059&ten=1&en=4

We show the histograms in which are relates the average, minimum and maximum, of the course and the Grade, in the three years we are studying, which allows comparing the evolution of the evaluation of the subject, in the year that innovation was introduced, the previous one and the following where the innovation was maintained and improved, showing its sustainability during the time (Figure 3).





Course 2015-2016 N=28

Figure 3. Evaluation of the subject (ASIGNATURA) and the Minimum, Mean and Maximun intheGradeinPedagogy.Font:SGICofUNED.https://app.uned.es/evacal/questgen.aspx?cu=2016&tecp=6302&ca=63024059&ten=1&en=4

The evaluation of the subject through the Internal Quality Assurance System of UNED, in percentages scores, on a maximum of 100%, shows a very positive increase since the first or basic course, in 2013-2014, with a students participation of N=14, received a score of 77.46%. In the year which the innovation was first time implemented, 2014-2015, the answers in the questionnaire were gave by N = 19, with a score of 84.36 %. And the year where the innovation was maintained, the course 2015-16, the answers in the questionnaire were higher, with a participation of 28 students, N = 28, giving a score of 97.6%, indicating an excellent evaluation result, and showing the sustainability of the innovation over the time.

The learning guided of theory, as well as of the practical work, in one virtual learning environment, is key to obtain a good learning result in students.

### DISCUSSION

The results obtained in this research, centered in one innovation based in an "Instructional design, to guide learning of theory and practice, in a Virtual & Personal Learning Environment', promoting the collaborative learning and the formative evaluation and feedback", have demonstrated their positive influence through the following indicators:

The participation in the forum on the practical work and in the forum of theory, in both courses, the first in applied the innovation, 2014-2015, and in the next one, 2015-2016 has been considerably incremented.

- The students presented on the first call, was incremented in 8.34 % points.
- The students approved to the first, was incremented in the academic year 2014-2015, in 18.36 % points, and in 2015-2016, in 19 % points.
- The achievement, the students' scores in June in the three courses, show improvement, proved through the ANOVA test, giving statistically significant differences in 2014-2015 y 2015-2016 against the course 2013-2014 (F=8,509, p=0,001 and p=0,000 respectively).
- The satisfaction with the innovation centered in practices, theory guided by teacher, promoting collaborative learning and formative evaluation and feedback, in a Virtual & Personal Learning Environment, obtained in the Questionnaire to Evaluate the course, in 2014-15, a Mean of 4.63, over 5, N=35.
- The satisfaction with the course, in the Institution Quality Assurance System Questionnaire, answered by 28 students, in the course 2015-2016, obtained a score of 97,6 % over 100.

To be competent is to be able to learn to adapt and respond to new situations i.e. to continue to learn throughout one's life. Learning by internet has a huge potential, but it couldn't be seen independently of an adequate instructional design and the formative feedback on the learning progress.

The evaluation of the innovation, with purposes of continues improvement on students, teachers and course design, has demonstrated its contribution to the improvement of educational quality.

We recommend the use of this instructional design in the UNED. Also we recommend it to other Online and Distance Higher Education.

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# Engaging Students' Learning with Elements of Formative Assessment

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## ABSTRACT

Formative assessment consists of activities undertaken by teachers and students that will provide them with feedback for the purpose of guiding teaching and to improve learning. Formative assessment may also be implemented by incorporating questionings, self- and peer-assessments into classroom teaching. With the integration of formative assessment, teachers may benefit by practicing it so as to enhance their teaching. Concurrently, students learning processes may also improve. This study investigates how formative assessment can be implemented in secondary Geography lessons and to investigate how it can enhance or develop the learning of 17 secondary school students in Brunei Darussalam. A qualitative approach was utilized to collect and analyze the data. Data were collected by means of video recorded lessons, interviews and a group research project.



The findings revealed that by implementing formative assessment components such as questioning, feedback, and assessments involving peer and self within the lessons, the students have shown improvements in their learning, in terms of acquiring knowledge and skills not only in relation to the study of Geography subject, but also in developing their 21<sup>st</sup> Century skills in communication and socialization.

Keywords: Formative Assessment, Geography, Teaching and Learning

### INTRODUCTION

The existing education system, overseen by the Ministry of Education of Brunei Darussalam was introduced in 2009 known as the National Education System for the 21<sup>st</sup> Century (in the Malay language known as *Sistem Pendidikan Negara Abad ke-21* or SPN21). In realizing the challenges of the social and economic development in Brunei, the SPN21 aims to fulfill the Ministry of Education's vision and mission that is to equip Bruneian students with the 21<sup>st</sup> century skills instilled with *Melayu Islam Beraja* or MIB values (translated as the Malay Islamic Monarchy). The school curriculum and assessment play an integral part in Brunei's education system. In SPN21, the School Based Assessment for learning (SBA*f*L) was introduced in the lower secondary curriculum subjects in 2011 (CDD, 2010). SBA*f*L is a fusion of School Based Assessment (SBA) and Assessment for Learning (AfL). SBA*f*L is a formative assessment that is used to facilitate students' learning and understanding of their subjects.

In the upper secondary level subjects including Geography, students have to sit for the Brunei Cambridge General Certificate of Education Ordinary Level (BC GCE O Level) examination, which is summative assessment in nature. In the upper secondary, Geography is offered as an elective subject where the skills the students need to acquire are the ability to conduct research, think critically and creatively, communicate and participate socially thinking (Ministry of Education, 2009). Therefore, to ensure the effectiveness of students' learning outcomes, the use of appropriate teaching strategies and assessment are fundamental in the teaching and learning of Geography.

One of the major problems faced by the students is the difficulty in comprehending subject content, which in turn affects their test and exam results. In most cases, this is attributed to the students' poor command of English language. Geography demands students to have a good command of the English language, as it is the medium in which the subject is taught. However, this is not the only problem the students faced. Our observations showed most students could only answer simple recall questions in the knowledge and understanding level of cognitive thinking. Students were good at remembering facts by memorizing but not by understanding.

In Jaidin's (2009) study where she explored the conceptions of children's learning in government schools in Brunei, she found similar observations, where one of the learning conceptions held by the children was 'learning as remembering' mainly to pass examinations and to score good grades and marks. Similar opinions were reiterated in other local studies (Matzin et al., 2013; Yatab & Shahrill, 2014; Botty & Shahrill, 2015; Nawi et al., 2015; Caesar et al., 2016; Yunos et al., 2017).

## **REVIEW OF THE LITERATURE**

#### Formative Assessment and AfL

Formative assessment is always associated with the term AfL. According to the Assessment Reform Group (ARG, 2002), the process of AfL seeks to interpret the evidence to be used by the students and their teachers in deciding the learning stages. Formative assessment involves making any necessary adjustments to teaching concurrently within the stages in learning (Leahy et al., 2005) and provides information for teachers to adapt their instruction strategy to suit students' needs (Wong, 2007). AfL also informs a student-centered instruction responding to students' performance and progress (Stiggins, 2005), and enables students in taking responsibility of their learning process (Black et al., 2006; Kirton et al., 2007). According to Wren (2008), in order to successfully implement formative assessment to all students, there is a need to have a classroom environment that encourages success instead of competition. Additionally, teachers need to know and understand the learning objectives they are teaching by communicating this information in language that their students understand (Wren, 2008; Shamsu, 2012).



#### **Elements of Formative Assessment**

#### Questioning

The use of questioning has been mentioned in the Al-Quran as an effective method to facilitate understanding in education of the Muslim followers, for example, the use of questionings in the verses of Surah Ar-Rahman (Qur'an: 1-78). In AfL, questioning is vital in order to check for understanding as well as give feedback on incorrect responses (Fisher & Frey, 2009). Questioning can be used to promote thinking and classroom discussion (Black et al., 2003; Shahrill, 2009, 2013; Salam & Shahrill, 2014; Shahrill & Clarke, 2014).

Teachers are encouraged to ask questions that explores issues that are crucial in developing students' understanding rather than asking knowledge questions that can be answered quickly and only catered to the low level of thinking (Black et al., 2004). In other words, teachers should ask higher-order thinking questions of the Bloom et al.'s (1971) taxonomy of educational objectives. These types of questions may help our students in developing the 21<sup>st</sup> century skills such as critical thinking, problem solving, communication and social skills. Teachers should also increase the 'wait time' for students to answer the questions they asked to allow students to think (Black & William, 1998; Shahrill, 2009, 2013; Salam & Shahrill, 2014; Shahrill & Clarke, 2014; Panjang et al., 2017). All answers whether they are right or wrong can be used to develop understanding aimed at developing thoughtful improvement rather than getting it right at the first time (Black et al., 2003).

#### Feedback

Hattie and Hamperley (2007) regarded feedback as a powerful way to affect students' achievement. According to Askew (2001), feedback could be verbal, non-verbal, written, or a combination of these. Teachers present feedback to students either to individuals or to pairs and groups, or to the whole class. Embedded within the learning process, feedback have to be goal-referenced, appropriate, on-going, actionable, precise and comprehensible to students to allow self-adjustment on the students' part (McTighe & O'Connor, 2005; Wiggins, 2012). Teachers need to remember that giving feedback is more towards improving and not about evaluating the students' work (Black & William, 1998).

#### Self- and peer-assessments

Apart from receiving teachers' feedback, students themselves need to self-assess since learning can only take place on their own will (Black & William, 1998). In peer assessment, the students' work will be assessed by someone other than the teacher, and thus offers an additional element to formative assessment (Sadler, 1998). It allows students to give constructive feedback to their peer's performance. Newby and Winterbottom (2011) stated that peerassessment provides students with the chance to understand the successful piece of work's criteria. The students were willing to share ideas with each other and their feedback focused on improvements. However, some students prefer their teacher assessing them rather than their peers especially in relation to group assessment (Scaife & Wellington, 2010). Students may experience discomfort when it comes to assessing work other than their own and their peers may also make unnecessary judgments of their capability (Smith, 2009).

#### THE STUDY

The main goal of this study is to examine the implementation of formative assessment in the teaching of Geography lessons at the upper secondary level. Accordingly, this may be one of the ways to help students enhance their learning processes in order to improve the students' understanding of the Geography subject content and to develop their higher-order thinking skills. It is hoped that the students would benefit from its implementation. In addition, this study seeks to gain insights into the process of self-professional development, specifically in the area of teaching methodologies. The two research questions guiding the study are as follows: How can formative assessment be used in teaching upper secondary Geography lessons? And to what extent has formative assessment enhanced students' learning?



#### METHODOLOGY

A case study approach (Yin, 1994; Merriam, 1998) was used in this study. Throughout the research period, one of the researchers acted as a participant observer. A participant observer is a "*role adopted by qualitative researcher in which he or she is known to be the researcher by the participants and is thought of as the group members*" (Sowell, 2001, p. 363). The class was taken over for the whole four weeks from the Geography subject teacher and was taught the topic according to the scheme of work. The participant observer was able to gain the information on how the teacher did the formative assessment and to what extent formative assessment can be used in the teaching of Geography topics. Questionings, feedback, self- and peer-assessment techniques were embedded in the teaching process.

#### Instruments

#### Video recorded lessons

Every lesson was video recorded. A colleague helped to record the lessons conducted. There were five double lessons altogether of which two lessons were used for students to do presentations on their group research projects. This was when components of the formative assessments for example, questioning, feedback, self- and peer-assessments were integrated into the lessons. During the classroom teaching it was not possible to take field notes on the sequence of teaching process. However, observations were made after viewing the video recorded lessons to triangulate the data gathered. Recorded lessons allowed them to be viewed as many times as necessary so as to capture any relevant and related findings of the study. The recorded lessons provided a good pool of data since they covered the whole process. Wiggins (2012) asserted video recordings could help teachers perceive things they may not perceive as they perform. They help teachers learn to look for difficult-to-perceive but vital information.

#### Audio-recorded interviews

Another instrument used was semi-structured interviews with students in a focus group setting. The focus group interviews were undertaken to encourage discussion between interviewees, rather than between interviewer and interviewee (Morgan, 1988). The focus group interviews explored students' perspectives about the lessons when questioning, feedback, self- and peer-assessments were used and their active involvement during the lessons. The interviews included some open-ended questions so as to give enough flexibility for students to respond. Before the interviews, students were made to understand the purpose and were given time to share their views with the group members. The shared views were then used for discussions in a subsequent focus group interviews. All the interviews were audio-recorded, and on average, lasted about eight to fourteen minutes per session.

#### Group research project

Data were collected through the provision of group research project to students. Students had to complete the project in groups within two weeks. They were divided into four groups consisting of four to five members per group. This project was chosen because of the benefits students can obtain from it. According to Scaife and Wellington (2010), collaborating produces a better outcome with students learning from one another with discussions and stimulations, which may thus create innovative concepts and skills. Keppell and Carless (2006) stated it enabled relevant learning to take place through participation in a motivating and challenging project, which is linked to real-world issues. In this case, students were dealing with issues on food consumption patterns in different countries.

#### **Participants**

The chosen site for this research study was a secondary school in Brunei. The participants comprised 17 students from a Year 10 class (equivalent to Grade 9 High School American Schooling); consisting of nine male and eight female students who studied Geography as one of their subjects. Their ages ranged between 14 and 15 years old. The students would proceed to Year 11 in the following year for their BC GCE O Level in November.



#### **Data Analysis**

The data in this research was analyzed qualitatively. The recorded focus group interviews were transcribed. The transcripts were analyzed to identify emerging concepts or themes, with inductive coding used to establish such themes. The recorded lessons were reviewed to gather data used to respond to the research questions. These two data sources were triangulated to identify the themes, which were consistent across both data sources so that detailed and balance perspective of the research can be portrayed. The video recorded lessons and audio-recorded interviews have allowed data triangulation to overcome the threats of validity to the research. The data analysis collected by using a case study approach was suitable for answering the research questions. Reliability of research was achieved through the process of data triangulation.

### **RESULTS AND DISCUSSIONS**

#### **Utilizing Questioning Techniques**

In this study, utilizing questioning as one of the techniques of formative assessment was used in the everyday classroom practice. An example of the questions given to students in one of the lessons was to identify the differences of food consumption between the less developed countries (LEDCs) and the more developed countries (MEDCs). According to the teacher, this question required students to do some analysis and interpretation in their group discussion. At the beginning it seemed to be difficult for students to cooperate with each other during the discussion. Towards the end of the data collection, it was evident students were more comfortable not only with each other during group discussion but also with the teacher. They asked questions whenever they were not clear with the lessons. Hence, in this study, it was found that the questioning techniques had helped the teacher to check students' understanding and learned how to help the students. However, it was also found that the teacher should ask more questions, which explore real world issues critical to students' development of their 21<sup>st</sup> century skills.

### **Conveying Constructive Feedback to Students**

In this study, it was found that the comments given could have negative impact on students' confidence and enthusiasm. During data collection, constructive feedback was continuously given to students on their progress and their completed work. Some comments can have negative impacts on students' confidence and enthusiasm, therefore comments were given on students' work that needed improvement rather than on the individual. The following extracts were from one of the lessons on the difference of food consumption between the less developed countries (LEDCs) and the most developed countries (MEDCs). It shows how feedbacks were delivered on the point that was raised by one of the students.

Student 8 (Group 3): I want to ask Group 1. You focus your answer on MEDCs only on the excess of food but the question asked us to discuss MEDCs and LEDCs. You mentioned MEDCs have more food than LEDCs but you don't explain the LEDCs lack of food is due to what?

Teacher's note: Student 8 was commenting on the way Group 1 answered the question. He felt that Group 1 did not give a reason for the differences in the amount of food consumed.

Student 2 (Group 1): MEDCs have a lot more money than LEDCs, that's the difference.

Teacher's note: Student 2's answer was simple but some of the students still did not get it. I could see clearly from their facial expressions especially Student 8.

Student 8 (Group 3): But is it only because of money?

Teacher's note: I asked if there was any student who wanted to give further comment. I waited for about four minutes but no one said anything. So at last, I decided to intervene by giving feedback.



Teacher's feedback: Group 1 said MEDCs consumed higher calories when compared to LEDCs. However, Student 8 said they did not state the reason. Actually they did state the reason but only on the MEDCs side and it was not stated clearly. What they are trying to say is that MEDCs have more money so they can produce or purchase more food. Do you think that it would be better if they said something on LEDCs' side too? However, I also agreed with Student 8. He said money was not the only reason.

Teacher's note: Some students nodded and the lesson continued with the discussion on the other group's point. By now the students started to grasp the same point that they shared, namely they all agreed that MEDCs have more money to purchase or produce food for their population. I also informed the students that the other reasons for the differences would be discussed in the following lesson.

It was observed that the teacher should further reflect on the way the feedback was given to the students. The teacher could improve on giving constructive feedback by advising the students on their strength and advise them on how to develop their responses. The best feedback provides students with the information about their progress or lack of it towards achieving the expected standard and suggests actions they can take to come closer to it (Brookhart, 2008). The teachers in this study should encourage and give chances to their students the opportunity to enhance their learning (ARG, 2002).

### Engaging Students in Undertaking Self- and Peer-Assessments

During the lesson, the students engaged themselves with the processes of self- and peer-assessments. In the case of self-assessment, the students were given the opportunities to reflect.

Self-assessment from Student 2 (Group 1):

My strength: *I am very confident. I have a voice that most people can hear. I make eye contact with people.* My weaknesses (to be improved): *Maybe I have to explain the content a little more so that my peers and teacher can understand better.* 

Self-assessment from Student 4 (Group 2):

My strength: My voice was clear and I explained content clearly.

My weaknesses (to be improved): I think I am less confident, I don't maintain eye-contact with my peers and teacher and I'm also very nervous.

The challenges faced by some of the participants in this study were similar to a local study by Rashid and Jaidin (2014). The teachers in the study by Rashid and Jaidin (2014) highlighted that in order to develop students' peerassessment and self-assessment skills will require a lot of effort, particularly in getting the students to give each other constructive feedback rather than merely giving superficial or judgmental comments. Constructive feedback needs to be more descriptive and clearly explained, as noted by Student 2 from Group 1 in the current study.

Consequently, formative assessment cultivates the skill for self-assessment in order for the students to develop the ability of being reflective and manages oneself successfully (ARG, 2002). For peer-assessment, the students were reminded to give constructive feedback on their peers' work, not to the person, and to be positive and open to their peers' feedback on their work. The following represents the reflections from individual students regarding peer assessment.

Student 6 (Group 1): ... and then the other people, they tell us what we need to improve on. So I, we know what are the weaknesses and how to improve them. I learn... we learn that you should not be mad at other people when they gave us comments. We should think it as constructive feedback instead of thinking of it as a negative thing. So we can produce better work.



Student 7 (Group 2): We try to tell them their weaknesses, what they need to improve. We felt very happy that we know our weaknesses.

Student 5 (Group 3): We can see the weakness and tell them to improve that and tell them their strength.

Consequently, peer-assessment allows students to listen to their peers' ideas and evaluate them (Black et al., 2004). However, in this present study, it was found that the students commented more on the ways to improve their presentation performance. The peer assessment had made the assessment experience less constructive. And thus, the peer assessment should provide students with the chance to understand the successful piece of work's criteria (Newby & Winterbottom, 2011).

### **Encouraging Social and Communication Skills in Group Work**

The project that the students performed in groups assisted them to develop social and communication skills. Although these students were in the same class for almost seven months, some of them did not know each other well and seldom talked to each other before the project. Some of the students' comments are given below.

Student 6 (Group 1): It's really fun because I mostly don't talk to some of them but after doing that project together, we bonded.

Student 8 (Group 3): We have to communicate with each other. Even though it's really hard, challenging.

Student 10 (Group 4): Although sometimes we are not very close in class, we have to talk and discuss with each other because we have to be in teamwork.

Overall, the students indicated that they enjoyed their learning experience from the group work where it helped them with their social and communication skills. Hence, concurring with Johnson and Johnson (2004) that using the teaching strategy of group work encourage socialization.

### CONCLUSIONS

Formative assessment can be implemented by incorporating questionings, feedback, self- and peer-assessments into classroom teaching. Questioning techniques can be integrated throughout the lessons by asking constructed questions measuring students' higher-order thinking skills. This technique can promote interaction and supportive classroom environment (Black et al., 2004; Reynolds, 2009). Providing constructive feedback allowed scaffolding students' learning direction by showing them where they are in respect to their learning, their current achievement, strengths and weaknesses as well as to provide suggestions on ways to improve further. Besides, strategies such as sharing and clarifying the objectives of learning early on in the lessons aided the students in being more focused on their goal and consequently to achieve it (Harris, 2007).

By implementing self- and peer-assessments, it also provided the students the ownership of their learning (Leahy et al., 2005; Newby & Winterbottom, 2011). They were able to self-reflect on their own strength and weaknesses and recognized ways to improve them. The integration of formative assessment elements in the project given has developed students' self-confidence not only in presenting but also in giving constructive feedback to their peers' work (Brew et al., 2009). The project also strengthened their 21<sup>st</sup> Century skills on socialization (Johnson & Johnson, 2004; Sulaiman & Shahrill, 2015), communication and teamwork or collaboration (Strachan & Wilcox, 1996; Othman et al., 2015; Shahrill et al., 2015; Lim et al., 2016; Wood et al., 2017).



This study has a significant purpose in enhancing the pedagogical processes in the classroom. It allows for the creation of new knowledge based on previous research and our findings. As for Geography lessons, further research is recommended on other topics such as Map Reading, River and Coastal, Development and Industry as well. Similar research could also be conducted with other year levels with different student age groups. Additionally, similar research may be conducted in primary classes to see how it can help to prepare pupils before they enter secondary schools.

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# English as Foreign Language in Ecuadorian Primary Schools Before its Official Introduction into the National Curriculum. What Have We Learned from it?

# **Eder INTRIAGO**

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### ABSTRACT

Between 2016 and 2017, English as a Foreign Language (EFL) was officially introduced as a compulsory subject in primary schools. Prior to this, EFL teaching in primary schools held the status of an elective subject or complementary activity, to the point that its inclusion in the school curriculum depended, among other aspects, on the school principal's decision. In view of this, this paper sets to reveal the ups and downs that EFL in the primary underwent before acquiring official status. To do so, one hundred and twenty-one primary EFL teachers from several provinces of Ecuador were surveyed, and eight school principals were interviewed. The most salient features observed had to do with absence of trained teachers, nonexistence of a curriculum for this subject, deficient infrastructure and insufficient knowledge in terms of methodology. This investigation has touched on some curriculum, logistical, technical and policy-making aspects that the government should pay attention to. The introduction of EFL in primary schools since 2016 presents new challenges and concerns, as well as hope for stakeholders. In this sense, educators and researchers have an opportunity to help along the change Ecuadorians want for their children.

Keywords: English as Foreign Language, primary schools, new curriculum

#### INTRODUCTION

The first University English Language Program in Ecuador was founded in 1928 at the Central University of Quito. During the 30s and 40s, other English language programs were opened in Guayaquil, Cuenca and Portoviejo. Espinosa (2007) explained that in the mid-40s, English replaced French as the foreign language of the middle and upper social classes in Ecuador. *Colegio Americano* was founded in Quito during the presidency of Galo Plaza Lazo to promote English as a global language. However, only students in the upper secondary benefited from learning English at that time. English language was not mandatory in any public primary schools and it only happened at private primary schools. In secondary public schools', principals included it in the curriculum depending on the human and economic resources availability. This condition contrasted with private elitist high schools because English-Spanish Bilingualism learning became the most important elements for trading their educational services during the 1980s.

Significant changes have been made in the education system after the Constitution of the Republic of Ecuador 2008. However, English language teachers of public schools demonstrated proficiency in English at the A2 level of the Common European Framework of Reference for Language (MCER) which was evidenced via a series of tests given by (Ministerio de Educación, 2011). Also, English Foreign Language learning (EFL) in public primary schools (Ministerio de Educación, 2014) was proposed to be incorporated officially from 2016 in all schools in Ecuador. In addition to this, Ecuadorian universities have adopted the legislative mandate to introduce English into the entire public education system thus, from 2015 they worked on the redesign of vocational programs that respond to the identified national demand of English Language teachers. This paper sets to reveal the chronological evolution of the EFL in the primary schools underwent before acquiring official status in Ecuador.

### **Evolution of English Teaching Curriculum in Ecuador**

The evolution of English teaching as part of the core curriculum in Ecuador has four key periods: the CRADLE project (1992-2006), the national educational reform (2006-2012), the project Advance for education (2012-2015), and the current period for the massive teaching of English in Ecuador from 2016.

### The CRADLE Project (1992-2005)

Having as an objective to offer a better access to English language instruction in all public schools, the Ministry of Education created the Foreign Language Administration Division [*División Nacional de Idiomas Extranjeros*] in 1992, under an agreement established with the British Council. Thus, the project for Curriculum Reform Aimed at the Development of the Learning of the English (CRADLE) was set (Haboud, 2009).



English as Foreign Language (EFL) was introduced in Ecuador as a relevant curriculum reform in public secondary schools from 1993, whose main objective was to "innovate and strengthen the process of teaching and learning the English language, and to provide adequate infrastructure for the development of the new curriculum" (López, 2011, p. 41); offering "secondary students a solid foundation in EFL, with an emphasis on developing their listening, speaking, reading and writing skills (Caizaluisa, 2012). So, educational levels in Ecuador were divided in three different sections from 1996: a kindergarten, primary school (from 1st to 6th grade), and high school divided in two sections lower secondary (from 7th to 9th grade) and upper secondary (10th grade to 12th grade) (Ministerio de Educación, 2011).

In addition, the Model for Intercultural Bilingual Education (MOSEIB) was also launched in Ecuador in 1993; and it was put in place to recover the language and culture of the Ecuadorian ethnic populations (Conejo, 2008; Oviedo & Wildemeersch, 2008). To achieve this goal, indigenous people had to receive an education in their native language, resulting in the offer of the Intercultural Bilingual Education (EIB). "The EIB is a subsystem of MOSEIB for both the ethnic groups as well as for the rest of the population" (Actores del Sistema de Educación Intercultural Bilingüe, 2013; Aguerrondo, Crespo, Robalino, & Van Damme, 2013; Soto, 2015).

However, the globalization tendency led the government to the decision of improving the Ecuadorian population competitively in the region which reaffirmed the necessity of developing English language curriculum in Ecuador. Thus, the main contributions of CRADLE project were:

- Ecuadorian teacher's professional training by the British Council under the sponsorship of the Ecuadorian Ministry of Education.
- Production and distribution of a set of books named: Our world through English (OWTE); which was developed considering the Ecuadorian context to be used in the secondary.
- Inclusion of five hours of English classes per week in the curriculum map in all public secondary schools.

The increase of English hours per week was intended to be done in a progressive manner, starting from eighth grade of Basic General Education system BGE in the *Sierra* and Amazon regions regime in October 1993 and in May 1994 in the provinces of the coast. Nonetheless, this did not happen and by 1997 the number of periods of English class was still three classes week.

#### The national educational reform (2006-2011)

The results of the examination applied to the students of public schools in Cuenca city in Ecuador during 2004, showed the low results of 10.3 points out of 20 points. According to Calle (2012), these results were related to the fact that "public school teachers did not use strategies that strengthen communicative competence" (p.2). During the same year, the secondary was introduced the constructivist model in teaching English which meant 5 hours of class per week, and some private schools even more.

The main objective of the new curriculum was to introduce technology innovation in educational system. It also promoted the development of the human condition, intercultural identity, multi-nationality aspects, and inclusion. The reform gave major emphasis to Spanish language and Literature, Mathematics, and Social and Natural Sciences. At this point, English was not yet officially part of the primary schools' curriculum.

From 2009 the Ministry of Education established on the agreement 0611-99, a new curriculum which included five periods per week of English class (45 minutes per class). Such reform was not applied uniformly, especially in the high School *bachillerato*, because many secondary schools lacked EFL teachers, many high school principals considered that English was not an important subject and parents were not able to pay for extra English language texts for their kids. Finally, in July 2011 through the Government Agreement No. 242-11, the number of periods for EFL classes in the *bachillerato* was regulated as five mandatory class periods per week in every private and public institutions (Ministerio de Educación, 2011).



#### The project Advance for education (2012-2015)

The Foreign Language Administration launched in 2012 the Advance English Project (AEP) as a way to provide support and guidance towards English teaching and learning processes in the public schools in Ecuador (Ministerio de Educación, 2012). It consisted in the publication of the English Language Learning Standards (ELLS) in 2012. This curriculum was aligned to a cognitive and constructivist teaching approach with a social and pedagogical view, which established the outcomes expected to achieve at the end of a proficiency level, based on the Common European Framework of Reference for languages (CEFR). It also delineated the knowledge and skills to be mastered by in-service teachers (Equipo Técnico de Proyecto Inglés, 2012).

The Ministry of Education assessed 5000 English teachers at the national level in 2013. The results indicated that only 2.4% of those evaluated obtained a B2 CEFR and according to the international program Education First, Ecuador ranked in 2015 in position 38 of 70 countries in the world where the English language is taught.

The number of students that were admitted at the tertiary level of education in Ecuador doubled during 2014; (preschool 317.701; primary 1.825.288; secondary 1.801.918; tertiary 1.458.762) which increased the English teachers demand whose number was 213,886 in 2014 (Antamba, 2015). Of that, 67% of the teachers were in the public segment, 27% in private schools, 5% in *fiscomisional* (combined government and religious schools), and 1% in municipal schools.

The program *Quiero ser Maestro* [I want to become a teacher] offered the opportunity to become an English teacher of the Ecuadorian educational system. The candidates had to demonstrate proficiency in English at the Common European Framework of Reference for Languages (CEFR) B2 level. They also had to approve evaluations about content-area knowledge, logical and verbal reasoning; and the execution of a demonstration class. The current English language teachers should also reach the same standard. This program also facilitated the training of English teachers through immersion programs in the United States and the Caribbean (Instituto Talento Humano, 2015). According to Paez (2013) this plan raised the work in mastery of the language that involves the development of the teachers' capacities as they know, understand and use the main theories and research related to language structure and acquisition, curriculum, assessment procedures, and ethical commitment. As a result of the program, the number of university professors with a master's degree increased from 7,899 to 11,307 in 2008-2012 (Gallegos, 2015). However, this educational project was financed with the oil exports revenues until 2014 when the reduction of oil world price affected the national economy (Villafuerte and Intriago, 2016).

### The beginning of Massive English Language Teaching in Ecuador 2016

In 2015, the Ministry of Education and Ecuadorian universities network began a process of curriculum standardization in cooperation with the US Embassy. This new curriculum for teaching English had 3 objectives summarized in (1) Development in the learners of understanding of the world and other cultures, the communication of their thoughts through English. (2) The development of the personal, social and intellectual skills required to assume their potential productive participation in the growth of the world, and finally; (3) creation of a taste for language learning at an early age, through positive learning experiences.

At the beginning of 2016, skills acquired in English were expected to be developed from the components of communication (a) listening, (b) speaking, (c) reading, and (d) writing, based on Common European Framework of Reference for Languages (MCER). However, many tasks are still pending to be completed as the EFL teachers are being trained, teaching material are being developed, and educational centers are equipped with the required technology.

#### Stakeholders' perceptions about scenario for English language teaching in Ecuador

Here are exposed the results of a survey in which participated 120 Ecuadorian English language teachers and educational institutions administrators. The 60.6% of participants work in the coastal region and 39.4% in the Sierra. Similarly, a 75.5% of the people surveyed work in the urban areas while 24.4% work in the rural areas. Finally, 76% of participants were female, 20% were masculine and 4% declared other genders.



Throughout the analysis of data collected, it was possible to identify a **wide** variety of realities from region to region. In the Amazon region, for example, teachers in a public primary school are not required to be qualified as an EFL teacher, as long as they demonstrate proficiency in any of the language skills.

Current situation for massive English teaching in Ecuador					
Categories	Subcategories	Statistic			
Kind of teacher	All subjects' teacher (including English)	85.90%			
	Only English teacher	14.10%			
Number of hours class/week	5 hours class/week per course	50.70%			
	3 hours class/week per course	17.00%			
	Less than 3 hours class/week per course	32.30%			
Teachers' English level	A2	10.00%			
	B1	42.90%			
Observation: 21.40% of participants had not been	B2	24.30%			
certified.	C1	1.50%			
Teaching approach preferred	Grammatical-translation	43.70%			
for teaching	Natural	29.60%			
	Reading	36.6%			
	Audio-lingual	39.40%			
	Cognitive	33.80%			
	Communicative	64.80%			

#### Table 1

Source: Survey applied / 2016.

A typical EFL lesson in primary school has been limited to the teaching and memorizing of a few segments of vocabulary: the alphabet, numbers from one to ten, colors, days of the week, months of the year, parts of the body, and in some advanced classes the names of some vegetables and fruits. Very rarely, the class involves hands-on activities to address the resolution of a problem in a group. Most of these vocabulary lessons have been given without context and have lacked meaning and relevance for the learners.

### CONCLUSION

ELT in primary schools is critical since it may become a key factor in determining where English language education will go from the basic elementary to the tertiary level. This research findings revealed the following challenges:

(1) Setting clear goals for learning English, in the national curriculum for primary schools that are aligned with language proficiency standards of the CEFR,

(2) Articulating the curriculum of English in a way that promotes gradual continuity from the basic elementary grades to the lower and upper secondary levels,

(3) Developing an effective teaching methodology and adequate textbooks



It is crucial for the universities to prepare teachers as reflective practitioners that analyze their teaching and keep innovating their practice.

(4) Establishing an effective system of pre- and in-service training for primary school teachers of English as well as a recruitment system for quality teachers.

(5) It must be noted, especially, that to date most universities train students to work as EFL teachers in the secondary, opening the opportunity for undergraduate and graduate English language programs that target the primary to be created.

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# Enhancing English Speaking Interaction in Future Foreign Language Teachers: Case Study Corrective Feedback through Google Sheets

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### 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; Spragueb, 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 Faceback (CF) on the corrective focuses of the corrective focus of

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 descripting 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 Potter	Adventure and Romance	Lower Intermediate	Audio CD	Reading and comprehension questions
'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"	Robert Louis	Mystery	Higher Intermediate	Audio CD	Reading and comprehension

Black Cat Publishing ISBN 978 7 5617 3590 9	Stevenson				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	<ol> <li>Setting English learning goals</li> <li>Choosing a role for discussion in groups</li> <li>Selecting the texts</li> </ol>	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
<ul><li>3. Assessment (meta- analysis)</li><li>Self assessment External tutoring</li></ul>	<ol> <li>Videotaping of LC session (discussion part)</li> <li>Self assessment through the individual observation of videos.</li> <li>Giving feedback via Speaking Interaction Performance Rubric through the observation of videos on the part of the instructors.</li> </ol>	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.

	Score 3.	Score 4.	One other linguistic
	Comment: Attention. The	Comment: It is noted that it	aspect is related to
	pronunciation is not bad at all,	strives to have a	pronunciation. Students,
	only that the strong influence in	pronunciation that is closer	in this description, are
	the mother tongue sometimes	to the natural, there are	invited to consider the
Phonological	denotes certain confusions that	aspects that can be	root of their weak
control	are related to the vowels, the	considered as the rhythm and	pronunciation. Although
	same ones that are not in the	volume, that cadence marked	the comment whose score
	mother tongue. It is	in the highs and lows make	is 4 provides info to
	recommended to practice the	that when expressing the	sound more natural, the
	other 10 vowels that are not in	words are charged More	terminology employed
	Spanish. Another, timely	strength and do not always	might be an obstacle to
	observation is to relax the	feel as detached from what is	comprehension.
	consonants so that they are not as	meant	
	sharp as the, P, T, R.		

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	l in the LCs.
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No	Items	1	2	3	4	5	Ν	Categories
1	I used new words in sentences or sentences that I built as exercise to remember them.	0	5	23	70	2	10 0	
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	10 0	Memory Strategies
3	I used rhymes to remember new words from the readings.	0	4	72	22	2	10 0	billiogios
4	I repeated the new words several times	0	0	8	15	77	10 0	
5	I practiced the sounds of English	0	0	6	90	4	10 0	Cognitive Strategies
6	I used the words I know in different ways	0	6	21	73	0	10 0	0

7	I started conversations in English this week	0	14	74	12	0	10 0
8	I tried not to translate word for word.	0	0	8	24	68	10 0
9	I read in English for pleasure this week	0	0	10	12	78	10 0
10	I have written notes, messages in Whatsapp, Messenger, letters or informs in English	0	0	8	21	71	10 0
11	I summarize what I read and hear in English	0	0	66	21	13	10 0

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	
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	Compensati on Strategies
18	I reduced ideas, omitted difficult information, and used simple worlds	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	
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	Metacogniti ve Strategies
23	I have clear objectives to improve my English skills.	4	11	8	72	5	100	1
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

				0	0			1
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	
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	Affective
34	I noted in a journal my feelings about learning English.	64	23	10	3	0	100	Strategies
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	
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	Social Strategies
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.

Now, 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 used 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

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# Enhancing International Baccalaureate Students' Speaking Ability Through Oral Presentations

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#### ABSTRACT

This study aims at analyzing international baccalaureate students' perspectives towards how taking part in oral presentations influences their English speaking skills. Forty-one students participated in the study; 27 students were enrolled in the second year of the international baccalaureate program at a public high school in Ecuador and 14 in the third year of the same program. The participants of the study completed a questionnaire that was composed of thirteen Likert Scale items. In the questionnaire, students reported whether some points had increased or improved a lot, moderately, little, or very little. The data was analyzed by conducting a factorial analysis of main components with a Varimax rotation system. The results show that the participants' speaking skills have been positively influenced in four areas; improvement of students' oral discourse, responses processing, vocabulary and grammatical construction, and non-verbal interaction. These four factors explain the 72.16% of the variance. Age and sex had no impact on the results.

**Keywords**: oral presentations, speaking skills, discourse, vocabulary, grammatical construction, non-verbal interaction, international baccalaureate.

#### INTRODUCTION

Developing speaking in their students is a major objective for teachers in English as a foreign language (EFL) classrooms in Ecuador due to the main purpose of the EFL Ecuadorian Curriculum is to have learners bring up to a B1 proficiency level by the end of high school. This level is aligned to the Common European Framework of Reference for Languages (CEFR) which states that learners at this level will be able to communicate on a great variety of situations and also to develop conversations on familiar topics like family, work, and travel, among others.

In Ecuador, public high schools can offer two academic programs; Polyvalent Unified Baccalaureate (PUB) program and/or International Baccalaureate (IB) program. The institution where the study was conducted both programs, but we worked with students enrolled in the IB programs. Students who are involved in this program must prepare for taking the IB exam, apart from preparing for getting the B1 proficiency level which is expected in both programs. The IB exam includes a speaking test for which students' oral production is recorded and evaluated by a teacher of the institution of origin and an external examiner (teacher of IB programs from another country).

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For this reason, creating opportunities for students to practice English is an important aspect that EFL teachers must take into consideration for their speaking skills development. In this respect, in order to encourage students to practice the target language in a meaningful way, the institution where the study was conducted, implemented oral presentations as a part of the class activities.

#### **Oral presentations in EFL classes**

The oral presentation is a common technique adopted by EFL teachers with the purpose of improving speaking fluency and also for increasing students' confidence when speaking (Al-Issa & Al-Qubtan, 2010). This activity provides meaningful opportunities for students to practice the target language as well as engage them in effective communicative interactions (Živković, 2014). Additionally, the use of oral presentations in EFL classrooms provides teachers with valuable information about students' errors on the production of the spoken language. In fact, through speaking activities teachers can identify students' weaknesses in the use of the target language and search for ways to counteract such deficiencies; this way, teachers will contribute to "consolidate students' linguistic knowledge" and "the development of communicative competence" (Wang, Teo, & Yu, 2017, p. 4). This is supported on what is mentioned by Krashen (1987) who asserts that error correction enables learners to assimilate the right form of a rule.

The development of oral presentations brings many benefits to language learning. They, for instance, (1) promote oral production through students' questioning and encourage learners to take part in effective speaking interactions. In this respect, some participants in Chou's (2011) study pointed out that questioning allowed them to interchange ideas with their fellows and also stated that this kind of activities turns the class into more interactive and communicative. (2) They provide learners a venue to analyze, comment and interchange ideas in an authentic learning environment (Tuan & Neomy, 2007; Donato, 1994). (3) They contribute to pronunciation development, this is supported on what is mentioned by Levis & Grant (2003); in their study, they confirm that oral presentations "offer opportunities to target many pronunciation skills with minimal class instruction" (Levis & Grant, 2003, p. 15). (4) They foster language learning throughout "discovery and research" (AL-ISSA & AL-QUBTAN, 2010, p. 231).

It is valuable to mention that one of the most significant aspects of using oral presentations is the target language exposure students get involved in. According to Krashen' Natural Order Hypothesis, language is better learned if learners are exposed to language input (1987). In this respect, Nazara (2011) points out that the exposition to the target language has the greatest influence on speaking development. With oral presentations, students have the opportunity to listen to their peers about a variety of topics and expand their vocabulary. They also have the possibility of interacting with them as they ask them questions about the content of their oral presentations. Both the speakers and their audience also learn from the feedback (about grammar, pronunciation, or vocabulary) provided by their instructors after the oral presentations.

So far, we have discussed how oral presentations can benefit language learners to develop their speaking competence from what experts have reported in their works. In this work, we add knowledge to the existing literature about oral presentations by analyzing international baccalaureate students' perspectives towards their participation in oral presentations. As we mentioned before, oral presentations were implemented in the institution where we conducted this study as a pedagogical tool to boost students' speaking skills in English so that they be able to pass the IB exam. Then from the perspectives of the recipients of oral presentations, we intend to answer the following question: What benefits have students obtained from performing oral presentations?

# METHODOLOGY

#### **Setting and Participants**

The study was conducted between May and August 2017 with students enrolled in the IB certification program. This high school certification program comprises three academic grades. For this study, we worked with 41 out of 43 students (17 male and 24 female) enrolled in the second and third years of the IB program of a public high school located in the coastal region of Ecuador. The students volunteered to participate in the study. 27 students belonged to the second year of the program and 14 to the third year.



We decided to work with students enrolled in the second and third grades of the IB because they had developed oral presentations during the previous school years. The participants from the second grade had developed oral presentations throughout their first grade and those in the third grade throughout their first and second grade of IB. In average, every student performed between five and six oral presentations per scholar year. The participants' average age was 15.97, ranging from 15 to 17 years old. Eight students were 15, twenty-six were 16, and seven were 17 years old.

#### **Ethical considerations**

Following ethical protocols, permission was obtained from the high school principal. Informed consent was also taken from the students' parents. To ensure participants anonymity, students were asked to fill out the data collection instrument without including their names on them.

#### Instruments

A structured questionnaire was developed to obtain students' perspectives towards their participation in oral presentations. For the validation of the questionnaire, the researchers asked three researchers (who were not part of the study) to review the items and report their effectiveness. Some items were restated and those with similar meanings, removed. The questionnaire was divided into two parts. In the first part, the participants provided demographic information about themselves (age and gender); and, on the second part, they completed a Likert scale that contained thirteen items to determine how much they had benefited from participating in oral presentations. In the Likert scale, participants had to select whether ten points had improved and other three had increased *a lot* (1), *moderately* (2), *little* (3), or *not at all* (4) due to their participation in oral presentations. The Likert scale items were the following.

Ν	By performing oral presentations:	A lot	Moderately	Little	Not at all
1	My pronunciation has improved				
2	My fluency has improved				
3	My confidence when speaking in English has increased				
4	My public speaking performance has improved				
5	My speaking accuracy has improved				
6	My vocabulary has increased				
7	My knowledge about grammar structures has increased				
8	My ability to organize my ideas in English has improved				
9	My ability to express ideas in spoken language has improved				
10	My ability to interact in English with others has improved				
11	My ability to answer questions in English has improved				



12	My ability to use facial gestures and body language to convey meaning has improved		
13	My ability to use speaking strategies such as emphasizing, rephrasing, providing context to convey meaning has improved		

#### **Oral presentations procedure**

Oral presentations are developed in the first and second year of IB due to when students are in the last year of high school, they spend the whole school year preparing for taking their speaking and writing test. The oral presentations are performed twice a week, 3 students per day. Each student develops a total of 5 to 6 oral presentations per year. The delivering of oral presentations begins with topics about individuals and society, leisure and work, and urban and rural environment. In the second and third stages of oral presentations, students present presentations related to the United States common federal assistance programs, among others. Topics presented in the fourth and fifth stages of oral presentations are about well-known popular business in the USA. Students perform oral presentations about the aforementioned topics to enable their familiarization with content and vocabulary that they will find in most sections of the IB test they take to achieve their IB certification.

#### Data analysis procedure

Data from the Likert scale was analyzed using the IBM statistical software SPSS 22.0. A factorial analysis of main factors with Varimax rotation system was performed.

#### RESULTS

The factorial analysis resulted in four factors that explain 72,16% of the variance associated with the target of the study (see Table 1).

	Initial eigenva	alues		Rotation Sum	s of squared lo	adings
Factor	Total	% of	Cumulative	Total	% of	Cumulative
	Total	variance	%	Total	variance	%
1	5,796	44,584	44,584	3,879	29,838	29,838
2	1,32	10,157	54,741	2,072	15,939	45,776
3	1,173	9,024	63,765	1,936	14,894	60,67
4	1,092	8,397	72,161	1,494	11,491	72,161
5	0,902	6,939	79,101			
6	0,631	4,851	83,952			
7	0,503	3,867	87,818			
8	0,4	3,076	90,894			
9	0,345	2,656	93,55			
10	0,287	2,21	95,76			
11	0,247	1,902	97,662			
12	0,175	1,347	99,009			
13	0,129	0,991	100			
Extraction Me	ethod: Principal	Axis Factoring	g.			

#### **Table 1: Total Variance Explained**



Itoms	FACTOR	FACTOR	FACTOR	FACTOR
Items	1	2	3	4
4. My public speaking performance has improved	0,864			
3. My confidence when speaking in English has increased	0,774			
5. My speaking accuracy has improved	0,752			
10. My ability to interact in English with others has improved	0,727			
9. My ability to express ideas in spoken language has improved	0,719			
2. My fluency has improved	0,565			
1. My pronunciation has improved		0,862		
11. My ability to answer questions in English has improved		0,538		
7. My knowledge about grammar structures has increased			0,858	
8. My ability to organize my ideas in English has improved			0,691	
6. My vocabulary has increased			0,615	
12. My ability to use facial gestures and body				0.022
language to convey meaning has improved				0,922
13. My ability to use speaking strategies such as				
emphasizing, rephrasing, providing context to				0,589
convey meaning has improved				

#### Table 2: Exploratory Factor Analysis Solution

The results show that the benefits obtained by the students by performing oral presentations fall on four areas. The first area (Factor 1), which represents 29,84% of the variance, is composed of six items that comprise the improvement of students' oral discourse. These items indicate that oral presentations have contributed to the improvement of students' speaking performance, accuracy, and fluency, as well as the enhancement of their ability to express ideas when interacting with others in English. Students' confidence when speaking in this language has also increased, which is an important point for producing oral discourse when learning a language.

The second area (Factor 2) explains the 15,94% of the variance. This factor is structured by two items which lean towards response processing. This factor indicates that oral presentations have favored students' ability to answer questions and the improvement of their pronunciation, being the latter an important aspect to communicate with others in any language.

Factor three deals with vocabulary and grammatical construction; it explains 14,89% of the variance and is composed of three items. The analysis of this factor shows that by performing oral presentations on a regular basis, students' experienced an increase in their knowledge about grammar structures and vocabulary as well as an improvement in their ability to organize their ideas when speaking in English. Finally, factor four, which explains 11,49% of the variance, implies that students have experienced improvement in their ability to use non-verbal interaction (facial gestures and body language to convey meaning) and speaking macro skills (emphasizing, rephrasing, and providing context to convey meaning).

As can be seen, the perspectives of students expressed in the responses they provided in the Likert scale-based questionnaire indicate the benefits that they have obtained after performing oral presentations in their EFL class. The performance of oral presentations helped to improve students' speaking performance and their ability to process their responses as well as their ability to use non-verbal interaction and speaking macro skills. It has also contributed to the increase in students' knowledge about grammar structures and vocabulary.



These findings add knowledge to what other researchers such as Tuan & Neomy (2007), Donato (1994), and Levis & Grant (2003) have reported, who found that oral presentations provide students with opportunities to exchange ideas with their peers and contribute to the development of one of students' speaking micro skills, pronunciation. This study shows that oral presentations not only favors students' pronunciation but all aspects that involve the micro and macro skills of speaking.

#### CONCLUSIONS

The purpose of this study was to analyze international baccalaureate students' perspectives towards their participation in oral presentations. From the perspectives of the participants, we can conclude that this strategy has a positive impact of in students' communicative competence. The oral discourse of language learners can be highly benefited as students may experience an improvement in their speaking performance, contributing to areas such as accuracy, fluency, and confidence. Conversational skills are also benefited as students' ability to respond questions faster is improved.

Overall, the performance of oral presentations contributes to the development of both micro and macro skills simultaneously. This means that oral presentations represent a beneficial strategy for the development of students' speaking in foreign language contexts. We can also assert that the goal of the strategy in the institution where the study was conducted is certainly reached as oral presentations give students opportunities to practice the target language and therefore, prepare for oral component of the tests they have to take previous to receiving the high school certification. Finally, we advise the implementation of oral presentations to boost language learners' speaking skills for all the benefits reported in this work.

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# Ethical and Professional Education: The Right Decision

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#### ABSTRAC

How can one be a good professional, whether businessperson, politician, banker, professor or engineer, while being also a good person? Is it a contradiction that professional excellence can occur in the absence of moral virtues? The channel opened by the conceptualization of the transcendent motives that exist behind a decision – together with the extrinsic and intrinsic motives already known from different scientific perspectives – contributes a way to unite theory and practice in ethical endeavours, and a possibility to learn where are we failing when we engage in a rigorous analysis of our behaviour from an ethical perspective. The three types of criteria for making decisions bring together, when deciding, three types of knowledge: the what (the economy); the how (all particular sciences) and the what for (ethical considerations, the treatment of the other). We do not make one decision to earn money, another one to become a competent professional and another one to be good person. When deciding, we put into our action (or not) the greatest profundity we can, and we conjure at the same time a moral personality (or not).

Keywords: Ethical education, moral virtues, transcendent motives, motivational quality, professional education

#### INTRODUCTION

For human beings the mechanism of decision-making is not only a way to live their lives, but to decide how to live them. Once a decision has been made, the person can control, from within itself, its actions, it can live its life holistically: it has a *biography*. However, this control is not guaranteed beforehand, since, as we know, the dominion over the intellectual self-awareness and the freedom from its desires and sentiments is politic and not despotic, and it is formed through action.

It is in action and in decision, and in the knowledge that their exercise implies – practical reason - where the unity of all the operational strands of man is reached, because they all converge in one sole action. The theoretical reason, or speculative knowledge, that emerges as the specific capacity of human beings that differentiates them from the other animals - the element that allows man to say "I") - does neither perfect human beings as such, nor is compromised in subjectivity. While this last one feels compassion, commits and perfects itself in the practical reason, in the decision. To choose is to choose *oneself*. The real unity of human beings within themselves and with the outer reality is won or lost in the exercise of free action.

The *ethical value* of action (the value it has for the decisor – the person taking the decision-), is different from the *social value* (the value it has for others). It is important to mark this difference in order not to reduce ethics to mere sociology. Hence, the ultimate criterion in deciding the ethical value of an action is not the "social acceptability" of the consequences of said action. This conception would make the mechanisms of the theory of human decision tremendously trivial, since it eludes the delicate articulation of human knowledge in the decision-making process. It also neglects to analyse the inner consequences the action has within the subject itself. Understanding this gives us an understanding of how moral virtues grow within ourselves, an essential condition for the issue at hand, since to talk about ethics ignoring the moral virtues is like talking about mechanics ignoring gravitational forces. We could make a more or less poetic discourse about it, but nothing even remotely close to a rigorous analysis.

The virtue so acquired manifests as an increase in the vital intensity that each of us adds to its own capacity. We are empowered. We have *more* power because we *are* more. That the end result of this operation remains inside us as agents of the action is something that needs to be stressed to palliate the neglect suffered by this very important inner dimension of human actions. It affects our manner of being. We make ourselves through it.

The philosopher MacIntyre (1987) has shown that the difficulty in recovering the original meaning of the word *virtue* comes from the loss of the theological, or finalist, sense of reality, and consequently, of the obscuring of the notion of human nature, of the blurring of our characteristic way of being as humans.



This is because virtue is the realization of those potentialities characteristic of the way of existing and behaving of human beings. If this way of being does not exist, or if it has a purely material character, the very sense of virtue disappears. It is at this point when we incur the risk of attempting to construct a conventional ethic with notions such as duty, consensus, emotion, usefulness, likeability, dialogue, love, pleasure or solidarity, all very well in themselves, but – with the anthropological sense dissolved and disconnected of each other- incapable of leading anywhere other than towards utilitarianism or relativism, realms both in which disorientation is insurmountable. On the other hand, the accumulation of rules and prescriptions to guarantee a positive human conduct ends up producing Pharisees.

In the exercise of choice, something is chosen, but ultimately what we end up choosing is ourselves. It is not a matter of wanting something for oneself, but *eo ipso*, a matter of wanting oneself for something. This is self-realization and hence, it is also self-construction, because a person is not the same person depending on the values or tasks that is committed to.

Ethical education has to do with the development of moral virtue. Any satisfactory conception of the process of formation of the ethical character has to integrate the basic tenet that we are not isolated individuals and, on the other hand, we can only approach human achievement when living closely and solidariously with other people. Our self-realization demands an ongoing dialogue with other human beings that are, in some sense, part of us and vice versa. And this is not in addition to the individual, but a constituting part of the person as an essentially social being. Living in partnership with others is an essential condition to live with dignity.

The person is an absolute, in the sense that is something unique, irreducible to anything else. Myself is not interchangeable with anybody else's. From a phenomenological-psychological perspective, the human *personal* character is perceived in the quality of this self, this *I*, being open to *you*. This minimum mutual acknowledgement between human beings, besides conditioning the acquisition of a fully human identity on the part of the individuals, is what makes possible the subsistence of this larger *we* that is the fabric that allows life in society in communities such as the business environment, the neighbourhood, the city or the political society. The *person* is essentially and simultaneously an individual and a relational being. The individual aspect alone cannot be stressed because "having no *mirrors* in which to reflect itself, the human being develops a fragile and poor personality, empty and full of complexes, and with the added difficulty that the *societal relation is relegated to the merely accidental*" (Alvira 1988, 24)

This is not a matter of generating altruistic actions or beneficent attitudes at random. A person, whoever it may be, and regardless of its circumstance, is untouchable, it has an incalculable value, it can never be exchanged for money or any other external or internal good. Woman and man are universal and transcendent realities. The wounding of anybody's dignity wounds, somehow, our own dignity, because the injured woman or man are never far from us, they are not strangers or indifferent to us.

What *real value* do we assign to those present in our lives? What real weight has those "others" in our decisionmaking process? Our reason allows us to identify them as human beings, but to value them as such, to internalize them as other "selves" we have to incorporate them in our decision-making process.

#### THREE CONSEQUENCES OF DECISION-MAKING WITHIN A HUMAN CONTEXT

Many authors from the Psychology of Learning (E. Deci, 1976; Schunk, 1982; P.R. Pintrich, P.R y E. de Groot 1990; A. Closas, M.L. Sanz y M. D. Ugarte 2011; etc.) had familiarized us with the distinction between the so called extrinsic and intrinsic motives. The first type refers to the world of sensate realities and aligns with the rewards or punishments the environment sends as responses to the actions of the individual: money, raises, prestige, rewards, etc. The satisfaction provided by the second set of motives is generated by the direct outcomes the action has on the subject executing the action, and not by an environmental response. Satisfaction such as that felt after performing a duty, engaging in professional learning, the acquisition of various skills, the sense of achievement, etc., are all intrinsic motives.

Pérez López (1993) breaks this dichotomy proposing a third type of motivation: the transcendent motives. These motives respond to the Franklian concern with the search for sense *outside* the subject, in the opening up of the person to the world. They address the consequences the action may have for those "others", or "other", that will receive the impact of our action, regardless of the effect the same action may have on the subject. These are the motives guiding those that are working to support their family, or on behalf of their country, or wanting to offer a good service to their clients, or those trying to be helpful to their workmates.



These motives may not be confused with self-realization or with the enjoyment derived from the regard of others, since self-realization is not concerned, other than instrumentally, with the repercussions of our own behaviour on others and the regard of others does not flow from the one who acts to the others but the other way around.

The knowledge of the existence of transcendent motives is not only the result of the observation of behaviour. It is deduced from the study of the dynamics of the action. The behaviour of the decisor while interacting with one or more persons produces several types of outcomes, each susceptible to attract attention and become a powerful source of motivation.

- 1. Extrinsic outcomes: The interaction itself, called the *efficacy* of the plan of action.
- 2. Internal outcomes: The learning of the active agent or the *efficiency* of the plan of action.
- 3. External outcomes: The learning of the reactive agent, or the *consistency* of the plan of action.

One or several of these outcomes could very well go unnoticed or be underestimated by the decisor, but he can notice them and, if interested, he may want to pursue them, turning the results into motivation for action. This is how the three types of motives indicated can be deduced (Table 1):

- 1. Extrinsic motives: What we expect to receive in exchange for the action. These motives respond to the most basic needs, those we could call material needs. They mean, ultimately, the possession of things or the possibility to establish sensate relationships with things.
- 2. Intrinsic motives: What we expect to learn or enjoy while performing the action. These motives respond to cognoscitive needs. They address the subject's inner world, the capacity to do things, to get what we want. Through the appropriate learning process, a person develops what is called *operational knowledge*, a set of skills needed to manage the surrounding environment. The sense of power and, somehow, the feeling of security derived from the psychological states that depend upon the satisfaction of these needs.
- 3. Transcendent motives: The manner in which others are expected to benefit from our actions. These motives address the affective needs, not only the need to be loved, but most specially, the need to love. These motives are linked to the attainment of appropriate relationships with others, that love us as persons and appreciate us for who we are, and not for the presence or absence of certain qualities, or because we are useful to them. The satisfaction derived from actions based on these motives is made manifest in the certainty of knowing that whatever affects us affects the other as well, because it affects us. "People have the ability to internalize make their own- everything that happens to other people. This internalization process is what we call, in a strict sense, love. People are capable of loving and being loved, and this relationship is what satisfies the emotional or affective relations" (Pérez López 1993, 60).

Consequences of	Types of knowledge	Types of motives to	Criteria for decision
action		be satisfied	
1. Efectiveness	1. Perceptional	1. Extrinsic	1. I like it
2. Efficiency	2. Abstrac rational	2. Intrinsic	2. I Know how to do it and I
3. Cosistency	operational capacities	3. Trascendent	can do it
	3.Aprpeciatory		3. And what about the
	evaluative capacities		other?

Table 1. Three criteria for decision-making.

Source: López-Jurado, M (2010) La decisión correcta. El aprendizaje de los valores morales a través de la toma de decisiones. Bilbao, Editorial Descleé De Brouwer

These three motives may be present when performing the action. A doctor's foremost concern, for instance, is the health of his patients, although by caring for them he acquires prestige, new knowledge and good earnings at the same time. These motives are not the exclusive prerogative of those who generously spend their life on behalf of others. They are present in any human activity. This is a personal attitude towards work and life. The three motives intervene in any action, but the pre-eminence of one upon the other depends on each individual. The manner in which a person allocates importance to each motive defines his or her motivational quality.

The differentiating factor of this type of motivation is that the action seeks to satisfy the needs of a person or persons other than the subject's.



The category of the need to be satisfied may be in any of the categories mentioned above: quenching their thirst, helping them become better technicians or learn a new software application, helping them become better parents, or quitting a drug habit. The determining factor is that we are seeking not a change in ourselves, or a result for ourselves, but a direct improvement of the other person's circumstance.

The search for transcendent motives as a guiding principle of movement is one of the main traits that differentiate humans from animals. This is the type of motivation we refer to when talking of generosity, or the orientation towards service, or solidarity, etc. Colloquial language offers us a sample of this: when we qualify a person as "very humane", we mean this person takes into account what happens to other people and is willing to help them, that is, the transcendent motives are very present in his or her actions. The opposite concept, that of a selfish or not very humane person defines a person whose actions are only directed to his or her own satisfaction, and do not take into account the difficulties that this behaviour may be inflicting on others.

# THREE DIFFERENT BUT INTERCONNECTED MOTIVES PRESENT IN THE DECISION-MAKING PROCESS

These three outcomes of the action are three different levels of reality, but are not detachable from each other. They are not mutually independent, but interconnected. The type of feasible actions each of us engages in depends on our inner state, that is, of the level of development of our will and our rationality. Not everybody is prepared to rescue somebody from a house on fire. To be able to do this, the person has had to previously develop the will and the capacity to help others. Hence our capacity to engage in increasingly costly interactions will depend on the level of development of our inner states. On the other hand, the inner states of the reactive agent, coupled with the exercise of individual freedom of action, determine.

We see then, that these three categories of reality called efficacy, efficiency and consistency affect the outcome, which is also influenced by the level of trust the reactive agent has in us, indicative of a particular inner state. A high degree of trust between two people allows a great deal of interactions between them that will be accompanied by the corresponding satisfaction they generate. It can be said that in this state all feasible interactions are already possible.

These three different levels of reality, since they are all significant in themselves, can be the motivating factors of our actions, and the outcomes of said actions will, in turn, cover different human needs.

The *real value* of a specific action depends upon the *value* of all of the outcomes and thus it would be incorrect to analyze the value of an action considering only one or two types of outcome, since the three are present whether the decisor wants it or not.

# THE MOTIVATIONAL QUALITY OF THE DECISION

Virtue cannot be learned in the same manner as theoretical knowledge is acquired. We do not become prudent merely by reading all the books written about prudence. It is a type of knowledge that *must be exercised* to really know it. This knowledge is updated via the solutions we give to intermotivational conflicts, that is, conflict that arises amongst different types of motives. Conflict that arises within the same type of motive is called intramotivational.

There can be no conflict of values in the theoretical line, or the unity of all values would not be valuable then, but it is obvious that there is a conflict of values in the practical plane caused by the unavoidable presence of evil in the world. Only in a world were all people were good people and all their values were realized would the conflicts between them disappear.

Pure egoism is probably as rare as pure altruism. Generally these three types of motives are present in any interaction. It is a normal motivation for teachers to exchange fees for services (helping students), to develop their professional skills (learning to teach) and make their students learn something specific. Naturally, the weight assigned to each type of motive is different for each person. Some teachers will place more value in obtaining their fees while others will favour the learning of their students. And this is true for any professional because it is true for any action of any human being.

It should be stressed that when we fail to incorporate transcendent motives in the decision-making process, it will become increasingly difficult for us to do so. The spontaneous impulse will be less and less sensitive to this type of motives while we will find ourselves gradually further from the most valuable aspects of reality. "Assigning a hierarchy to values implies the capacity to notice that there are different modes of reality and behaviour and that some have higher features than others" (López Quintás 1993, 444).

What does the decisor obtain when carrying out "consistent" actions? Something of such calibre that acting differently would be irrational and insane. However, the "reward" must be experienced to *know it* and to *feel it*. "We are completely different when we are moral. We change inside out if we exercise our autonomy deciding to be moral, in other words, if we relate to others granting them consideration as valuable beings in themselves" (Sábada 1995, 47). We recognise ourselves as subjects and not objects. We recognise ourselves as persons, and this recognition cannot be achieved by competition, but by seeing in the other what exists within oneself, setting in motion the reciprocal appreciations and assessments.

The model proposed here does not entail a renunciation of value as such. There is a preference, since the action is going to contain the three interconnected order of values and none of them can be maximized. The rule to decide correctly would be "to always include the third party". Not surprisingly, the more attractive trait from the perspective of solving a concrete and immediate problem is not acceptable from the perspective of consistency (taking into account the consequences that our actions would have for others). We will then seek a plan of action that while consistent – implicitly in pursuit of positive learning for the receptor of the plan of action-, has a minimum of efficacy. "Our personal axiological hierarchy is a result of our *preferences*. This preference, even if it does not contribute value, contributes at least valuation and places the subject in a concrete position before the values, so it is true that "preference has a creative action" (Lavelle 1951, 506).

To implement these not inconsistent actions, it is necessary the exercise of will power to restrain the immediate impulse – spontaneous motivation - to act in the most desirable manner at a given point. The moral virtues play a key role in the implementation of the right action: rationality aided by will has to stop and think of an alternative that contains consistency *a priori*, and then the subject has to act, after having conquered the spontaneous impulse to act in a more desirable manner.

Since moral virtues are developed through practice, transcendent motives can be defined in two different manners:

- 1. Motives based in the action being good for the other address those properties of the action that will provoke those consequences in the subject's moral virtues: the action must be carried out because it is good for "the environment".
- 2. Motives based in the action developing moral virtues in the subject. Here transcendent motives are considered as those that improve the self-awareness of the decisor, the development of his or her ability to take better decisions.

Moral virtues contemplate the overall goodness of the action and not only the efficacy it has for the other. The paradigm of properly done valuations— a necessary reference in all education in values –requires, always, the incorporation of the "consistency of the plan of action", or paraphrasing Saint Augustine of Hippo, "Tell me what you love and I will tell you who you are."

Ethics is a science that pointed out, thousands of years ago, that the *de facto* value a human being assigns to another is not a matter of "what" is being "valued" - it is always a human being - but of "who" is doing the "valuing" and of the level of development this person has reached in the appreciation of what is valuable. There is a process by which we learn to value reality without being deluded by superficial appearances

It is essential to determine *which type of capabilities* we intend to develop through the educational process. If we develop only operational capacities, we are considering Moral Education as a "moral product" that is transmitted to a third party via the granting of an "Ethics credit", for instance. The formation of virtues will then be relegated to whatever can be obtained through disciplinary rules, extra-curricular activities, and of course, the exemplariness as role models of the educators themselves. This is all very well and it is important and necessary, but it is not enough.

If we also want to develop *evaluative capacities* together with the operational capacities, because we are teaching our students to do *complete valuations* of reality, we are entering in the deliberative process necessary to exercise prudence, helping then to foster a moral education. I say foster because it is a goal that is only reached if the recipient of this education so desires. In this manner we are endeavouring to provide an education that will enable them to be *competent* and *virtuous* professionals.

#### A PRIORI VALUATION OF EACH OF THESE MOTIVES

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Prudence is the virtue that foresees and anticipates future contingent scenarios before they take place in order to avoid a plan of action that would cause, rather than solve, problems. The assessment or valuation of these three levels of reality or *a priori* motives cannot be done only by one mechanism that assesses the three scenarios together. We need "three skills or *cognitive mechanisms*", (Pérez López 1998, 205), since to qualify as motives they have to exist before the action.

We use *memory* – perceptual knowledge –to evaluate *a priori*, extrinsic motives. A concrete perception – a set comprising action and reaction – accompanied by its associated satisfaction, sets the mechanism in motion anticipating the reward. Memory is the channel we use to connect with past experiences, imprinted inside our selves. These satisfactions are not transferable or communicable. Perceptual knowledge sets in motion the mechanism of spontaneous motivation. Animals move in this manner, their memory is extensive and intensive: they feel, unlike a computer whose memory is solely extensive and therefore feels neither pleasure nor pain resulting in zero cost operations.

We use *rationality* – abstract knowledge- to evaluate *a priori* intrinsic motives. Rationality is the archive where we file information about the value of things. This process takes effort: thinking, inferring and making predictions based on the available data is costly. Thinking means utilizing, making and applying all this data to feed the process and arrive to a decision regarding the problem at hand. Here is where the will intervenes, and it is at this level where we speak of rational motivation.

However, we may have a very "refined" weighing process to evaluate *a priori* only one dimension: efficacy. In this manner we use reason *instrumentally*, treating others solely "in function of our interests", as "a means to", but not as a value in and of themselves. This corruption of prudence has a degenerating effect on us as persons and eventually disables us from making the same plans we were able to make before, since the others, noticing our *modus operandi*, will not want to interact with us. We see how rationality articulates two intentions: the explicit, or what we seek with a specific plan of action, and the implicit, the degree in which we more or less care about the impacts of our actions on others. Rationality contributes the aim and the sense of the action and that is why it is such an important element in the development of moral values. Ignorance, when insurmountable, does not harm the subject morally, since he or she is using appropriately the available, albeit incomplete, data. The thinking process is done honestly before implementing the action, and therefore ignorance is not a corrupting factor.

What real value are we assigning the "other" receiving the impact of our action? The development of *valuative knowledge* allows us to value the other as another self. It allows us to discover personal realities, that is, the inner states of other person. This knowledge, however, calls for a pre-requisite.

It is important to note that the individual level of awareness (or capacity for awareness) of the personal realities – incorporating them in the decision-making process- is precisely the same capacity individuals have of feeling deep affective satisfaction. We tend to think that satisfaction of human needs depends solely in what takes place *outside* the person. This is true – and only partly so - for material needs. The satisfaction of affective needs depends mostly of some *thing* that is *inside* the person: the *state* of his or her *valuative knowledge*. Even when surrounded by others that truly love them, their deep affective needs will be unsatisfied in the absence of this type of knowledge, because they will be *incapable of discovering*, and consequently of *feeling* the affection they feel for them.

For this knowledge to be present two conditions have to be met: 1) the presence of another person (s) that feels true concern for us, and 2) to know in an *experiential* (rather than theoretical) manner their true inner state.

It is a matter of designing plans of action where it is assumed – intended - that we can trust the other. This entails a cost, an effort and the risk of not arriving to the decision desired by the other. We need to take this risk because avoiding these types of decisions precludes the discovery of the personal realities in an experiential manner, and therefore of *feeling their value*. To know experientially the inner states of the other- the non-perceptual realities - , we need to *experiment*, to design experiences to that effect.

The cogitative faculty, different from the animal estimative faculty, intervenes in this knowledge, however, if the decisor systematically judges others and their actions in functions of his or her own desires, the human cogitative faculty is reduced to the animal estimative faculty. The subject is then dehumanized and animalized.

"This habit, in the psychosomatic nature of man, can originate a stable dysfunction and even an organic injury (since the cogitative faculty, unlike the spiritual intelligence, has an organ, even though neurologists have yet to locate it and perhaps they never will).

Here we have one origin for a reactive psychopathology that can escalate to extreme forms of dementia, and that in any case produces a grievous fracture of the personality and a painful psychological existence" (Cardona 1987, 127).

It is important to stress again the distinction between needs that are satisfied by external factors – their satisfaction depends on the external-, and the *desires* or *internal needs* which satisfaction depends on the inner state, a self-generated state that is produced by the manner in which a person uses rationality and will.

Prudence can direct or lead the cogitative faculty. This faculty addresses everything real that is concrete in its temporal dimension from the perspective of *value*.

"The link between reason and the cogitative faculty allows us to understand that the practical reason has a *practical apprehension*, because if reason draws from the apprehensive powers as needed (*ex necessitate*), when it apprehends from the cogitative faculty it takes physical realities as goods. This practical apprehension is the basic act over which reason will act to be able to move on to deliberation, to practical judgement and to dominion. All acts that underlie the corresponding habits that culminates in *prudence*" (Sellés 1999, 183)

The development of this *valuative knowledge* – the knowledge that is reached when the decisor is guided by rational motivation based on transcendent motives- is essential for human happiness, because we cannot be happy merely by thinking about it, but with life. Happiness is experiential and this includes feeling. *Valuative knowledge* allows us to arrive to the point of "feeling" the value of the other as a person that loves us and that we are capable of loving.

"That is why it can be said that motivation based on transcendent motives is the motivation that tries to orient human action towards our own personal improvement at the deepest plane of our individual self: our capacity to feel others as people, our capacity to establish deep affective relationships with other human beings" (Pérez López 1993,61)

#### CONCLUSIONS

The ethical level is the existential level par excellence. Without ethical experience we can hardly speak of existence, and therefore we acquire prudence if we act with rational motivation based on transcendent motives. In our proposal for an education in moral values we offer the Case Method as a privileged method for decision-making. It's very structure confronts the subject with a concrete correct decision, here and now. The instructor, by means of maintaining a dialogue about the situation, brings out and helps manifest the reasoning process of the student until he or she arrives to the point of choosing a plan of action. The questions incorporated in the dialogue serve to rescue the student's basic guiding motives. There are three criteria related to decision-making: efficacy (economic value), efficiency (psychological value), and consistency (ethical and anthropological value)

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# Evaluating Teacher Effectiveness Using Matlab Gui

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#### ABSTRACT

Measuring teacher effectiveness is a vital activity for teacher development. However, evaluation of teacher's performance is crucial and sensitive affair. In this paper an effort has been made to develop a measuring tool for evaluating teacher's performance using MATLAB GUI (Graphics User Interface), the evaluator being higher authority. The teachers, whose performance is to be evaluated, are those from higher education, teaching at diploma and degree levels of Engineering, and, who do not have any formal training on teaching. The tool includes the skill and attitude components of teaching as it is well understood that an individual who joins teaching profession would be well versed with the knowledge aspect or content knowledge. This is an attempt to generate a feedback form for a fair, holistic, quantitative and qualitative evaluation of teacher's performance.

#### INTRODUCTION

The technical teachers, those teaching students at diploma & degree levels of Engineering, mostly join teaching profession without any formal training in the art of teaching. It is understood that the easiest way followed to teach is adapting the method by which the teachers had been taught during their students' days. Some teachers also follow a method of trial - and - error, which might not be suitable many a times. However, teachers continue to improve themselves with experience and students' feedback. Be it primary education or higher education, a teacher's performance is directly related to students' achievement in learning. Of late, teachers are being evaluated by different sources primarily for their improvement as also for higher accountability. Moreover, establishing an effective method of evaluating teachers' performance, itself, is challenging.

Teacher effectiveness and teacher efficiency are two different parameters that can judge the quality of learning by the students. The dictionary meaning of effectiveness stands as 'the quality of being successful in producing an intended result'. Efficiency refers to 'doing things right', that means getting the maximum possible output from the least amount of inputs. In this paper, the term teacher effectiveness will mean with reference to students' achievement in learning, i.e., effective classroom learning.



Hence, to understand easily, we can define teacher effectiveness as the ability of a teacher to improve students' learning. It also refers to 'doing the right things'. This would take care of all the domains, i.e., cognitive, affective, behavioral and those relating to skill. If we talk about teaching in terms of 'input-process-output' model, its output would correspond to the efficiency, while the outcomes of teaching would relate better with effectiveness. A highly qualified teacher need not necessarily be very effective in making students understand the concepts being delivered. On the contrary, a less qualified teacher can bring about more effective learning for the students through her/his teaching. Hence, it becomes a natural curiosity to know and comprehend as to what are the crucial elements that make a teacher effective.

#### **RELATED LITERATURE**

Teacher effectiveness would certainly mean the way a teacher performs in the classroom. Contributions of some researchers in this area are being listed here.

Rosenshine and Furst (1973) identified the five most important variables of teacher-effectiveness which are Clarity, Variability, Enthusiasm, Task-oriented and/or Businesslike Behaviors, and Student Opportunity to Learn.

Brophy & Good (1986) view it differently opining, "What constitutes 'teacher effectiveness' is a matter of definition, and most definitions include success in socialising students and promoting their affective and personal development in addition to success in fostering their mastery of formal curricula".

Studies have shown that several aspects of teaching practice directly influences learning by students and their learning outcomes (Brophy and Good, 1986; Wang, Haertel and Walberg, 1993).

It is a myth that good teaching follows naturally from subject mastery. Teacher effectiveness can be interpreted by the "Four Aces of Effective Teaching" (Walls, 1999), as mentioned in the study of Bulger, Mohr, & Walls, 2002, which can be listed as outcome, clarity, engagement and enthusiasm.

From a cognitive perspective, teaching may be defined as the creation of learning environments in which students maximize the possibility of executing the cognitive activities necessary for building knowledge and reasoning capacity (Floden, 2001).

As cited by Lovat (2003), effective teachers 'have a rich understanding of the subjects they teach and appreciate how knowledge in their subject is created, organized, linked to other disciplines and applied to real-world settings......'.

Teacher effectiveness has been termed as the impact that classroom factors, such as teaching methods, teacher expectations, classroom organization, and use of classroom resources have on students' performance as stated by Campbell, Kyriades, Muijs & Robinson (2004).

#### THE STUDY

Teaching effectiveness can be interpreted in different ways. From the findings of literature survey as also the experience of authors, certain parameters have been identified as essential factors leading to teacher effectiveness. They were also circulated among some of the experts and technical teachers to obtain their feedback and validate the criteria. It is well understood by practicing teachers that the content of what is taught influences how it is taught. Different areas are considered vital for teaching in addition to subject knowledge.



These have been broadly categorized under communication skills which includes verbal and non-verbal types accommodating body language, gestures, eye contact, etc., the other categories were teaching skills, classroom management, and instructional plan. Further, the teachers' ability to understand and apply the subject-matter in different ways, according to the context of their classes, the sequence of lessons, and their knowledge of the individual differences of students are also very important. Thus, feedback on teachers' performance is of paramount importance in today's competitive market. Moreover, we now talk of 360<sup>0</sup> feedback for a holistic view. In this study, feedback on teachers' performance by a senior colleague / head of the department / higher authority has been taken into consideration. Keeping this in view, the authors tried to explore the various criteria by which a teacher can be judiciously evaluated and found that the student feedback, peer feedback, parent feedback and feedback by higher authority would be beneficial for a teacher to improve her/his teaching.

Since teacher effectiveness is measured through students' achievement in learning, the components of creating a productive learning environment were explored. The objective of this study is to develop an evaluation tool to measure important aspects of teacher effectiveness. Any evaluation tool to assess teachers' performance would require setting up evaluation criteria to determine the level of performance of individual teachers for each of the aspects assessed. The criteria for judging the teaching effectiveness were brainstormed and identified. These were consolidated and classified as skill and attitudinal components. However, the proposed list is not exhaustive. For the purpose cited above, an instrument to provide impartial quantitative and qualitative evaluation by the higher authority, the Graphics User Interface (GUI) program was developed with MATLAB software.

#### **CRITERIA CONSIDERED FOR EVALUATION**

In addition to the parameters mentioned above, certain other parameters were also identified which result in teaching effectiveness, for example; teacher's flexibility to change the date of assignment submission, or class tests etc. Moreover, a teacher's enthusiasm and creativity also play a great role in teaching effectively. Again, a teacher demonstrating sufficient & updated subject knowledge is also highly essential.

A teacher has to have very good communication skills in order to pass the message across. In addition, she/he should be equipped with certain skills of teaching, for example inducting the students to the class in first few minutes, communicating expectations, defining the learning outcomes, questioning students, explaining, closing the class, to mention a few. Often, teachers take the help of teaching aids, but these must be used wisely as and when needed. These are considered to be the skill components as they can be improved with practice. Besides, teachers must know how to engage their students for active learning with a variety of activities and collaborative learning, so that the development of 21<sup>st</sup> century skills is taken care of. Providing feedback to students includes both formative and summative feedback, with an emphasis on the former, so that the improvement in learning becomes visible to students and teachers alike. Further, different types of assessment tools are needed to assess the attainment of various outcomes. The criterion of 'providing feedback to students' has been kept separately in addition to 'employing different assessment tools' to emphasize its role and relevance in student learning.

Teaching, being a complex activity, encompasses a variety of skills besides mastery in one's own subject matter. However, from the brainstorming, it is understood that the attitudinal components play a major role in defining teacher effectiveness. For example, a well-prepared and enthusiastic teacher would certainly display creativity in teaching. Similarly, the 21<sup>st</sup> century skills have become essential for the survival of the millennials. A teacher appreciating construction of new knowledge and its application to real-world settings would always address the queries of students. Such teachers displaying a positive attitude would be kind and empathetic to students besides being easily available and accessible to them.

In this paper only a few skill and attitudinal aspects, that are considered vital, have been mentioned. These areas have also been reiterated and prioritized as understood from the related literature review. The weightage to the skill and attitude components are allotted based on the priority to the respective parameters.

This weightage has been denoted on a seven point scale. Weightage of 7 indicates a parameter with high priority while that of 1 means the parameter with lowest priority. In this study, a criterion having weightage less than 3 has not been considered. However, the weightage can be changed as per the suitability of the study and the valid requirements of the evaluator.

weightage average = 
$$\frac{\sum_{i=j}^{k} w_i x_i}{\sum_{i=j}^{k} w_i}$$

In this study, j=1 and k=7 for skill criteria and j=8 and k=16 for attitude criteria. The value of 'x', provided by the evaluator is between 1 and 5 and weightage on different parameters are set under 7 point scale as illustrated in Table1.

Sr.	Teacher's Performance Criteria /Parameter	Parameter under Skill	Weightage
No.	(x)	/ Attitude Domain	Factor (w)
1	Demonstrating Good Communication		7
2	Demonstrating Adequate Teaching Skills		7
3	Employing Different Assessment Tools For Evaluation	]	6
4	Demonstrating Sound Classroom Management Skills	lkill	5
5	Using Different Teaching Aids Judiciously In The Class		5
6	Using A Variety Of In-Class Activity		5
7	Providing Variety Of Feedback To Students		5
8	Coming Well Prepared and Enthusiastic For The Class		7
9	Being Punctual In Her / His Class Timings		6
10	Encouraging Students To Ask Questions		6
11	Encouraging Development Of 21st Century Skills	de	6
12	Assisting Students To The Laboratory	titu	6
13	Being Easily Available & Accessible To Students	At	4
14	Providing Time To Students To Solve Their Queries		4
15	Providing Variety Of Learning Resources		3
16	Returning Corrected Assignments In Time		3
	$\sum x=16$		∑w=85

 Table 1: Parameters for evaluating Teacher Effectiveness and their related weightage

Thus, seven skill and nine attitudinal components are found to be important as are depicted in the Table 1 with respective weightage factor (w). However, keeping in mind the prime objective of the study and for the ease of workability and manageability of the display in window frame, the number of parameters was kept limited. Each skill / attitudinal parameter for the teacher is rated (x) under five point scale by the evaluator, qualifying 1 as 'not satisfactory', 2 as 'satisfactory', 3 as 'good', 4 as 'very good' and 5 as 'excellent'. To evaluate a teacher using the identified criteria, both quantitatively and qualitatively, software MATLAB has been used to create GUI. The evaluator (here higher authority) will rate the faculty on sixteen selected parameters, out of which seven are

The evaluator (here, higher authority) will rate the faculty on sixteen selected parameters, out of which seven are skill based and nine are attitudinal. There can be several other components of skill & attitude domains, but only these sixteen have been considered to be essential and vital for any teacher, especially in higher education, where they learn to teach on their own.

As the content knowledge has not been studied in detail in this study, the researchers have also considered its rating on a five-point rating scale to keep parity with the domains of skill and attitude. This rating has to be provided by the evaluator after receiving the information from respective subject expert, as the evaluator may not be from the same discipline. Finally, to obtain 'Faculty Performance with Gross Weightage Score', weightage on 'Knowledge', 'Skill' and 'Attitude' (KSA) are considered as 1:1:1. Using the GUI with inputs of required ratings, the 'Faculty



Performance with Gross Weightage Score', will be displayed in the GUI window the teacher's quantitative and qualitative performances based on the three domains, i.e., knowledge, skill and attitude (KSA).

#### ABOUT MATLAB

MATLAB which stands for MATrix LABoratory, is a high-performance language for technical computing, which includes computation, visualization, and interactive user friendly programming environment. A graphical user interface (GUI) is a human to computer interface. It is an effective way for user to interact with computers using windows, icons and menus, which can be manipulated by a mouse / keyboard. It helps the user to enter the related data to the respective places of GUI window and getting the required result with the use of 'Push Button' tag, eliminating the need to learn the MATLAB language in order to run the application.

Initial developed blank GUI Window for this work is depicted in Figure 1. Sixteen identified criteria for evaluation are shown with respective ratings 'Pop-up Menus', one 'Pop-up Menu' for knowledge rating, one 'Edit Box' next to 'Text Box' named 'Faculty Name' for entry of the name of the faculty and one 'Push Button' titled 'Faculty Performance with Gross Weightage Score' tag for getting final feedback qualitatively and quantitatively.

#### FINDINGS & DISCUSSION

Since subject matter expertise is not the sole determinant of effective teaching, several parameters were identified by brainstorming with the practicing teachers, about different areas which they consider vital for teaching in addition to subject knowledge. The weightage factor on respective parameter is considered under 7 point scale. The number of parameters can be changed with respective weightage factor using different scale and accordingly, the program can be modified.

Figure 2, displays the final GUI frame after entering all related inputs. Feedback is provided by the evaluator using the 'pop-up menu' for all listed parameters on five point scale (i.e., 'Not Satisfactory', "Satisfactory', 'Good', 'Very Good', 'Excellent') and typing the name of the faculty in the 'Edit Box' next to 'Static Text Box' named 'Faculty Name'.

The 'output' on teacher evaluation will be displayed on the MATLAB GUI window after pressing the 'Push Button' key named 'Faculty Performance with Gross Weightage Score'. Using the weightage factors in respective parameters as shown in Table 1, the program will also display the 'Pie Chart' on 'Skill' and 'Attitude' domain separately with labels. The overall qualitative feedback is based on the quantitative feedback as displayed in Table 2.

It is noteworthy that the several components of knowledge domain that account for its effectiveness in teaching have not been studied. The comprehensiveness of the tool can be increased by incorporating a teacher's way of representing knowledge, the manner in which she/he helps the learners assimilate information to construct knowledge, interaction with colleagues, ability to work in a team, and the like. Detailed studies in this regard would widen the horizon.





Figure 1 :Initial window of the MATLAB GUI (without data input)

Table 2 indicates that a gross weightage score of less than or equal to 40 is not desirable, and, therefore, has been labelled as 'not satisfactory'. It is clear from the above that the qualitative feedback has always been displayed as a positive statement. This is done so for the obvious reason that the purpose of any feedback is to improve the individual's performance and, hence, the statement ought to have a motivational function. Moreover, saying good or excellent does not carry much meaning as the feedback has to be descriptive rather than evaluative in nature.

Quantitative Feedback	Level of Teacher	Qualitating Eardheat		
(% Score)	Effectiveness	Qualitative Feedback		
Score < = 40%	Not satisfactory	A teacher can make a lasting impact on students, try to be one		
40 % <score <="50%&lt;/td"><td>Satisfactory</td><td>A good teacher can change the world, you can be one</td></score>	Satisfactory	A good teacher can change the world, you can be one		
50% Score $<-60%$	Between Satisfactory &	An exploratory teacher promotes discovery, explore		
J0% <score <="00%&lt;/td"><td>Good</td><td>with your learners</td></score>	Good	with your learners		
60% < Score < -70%	Good	A good teacher motivates every student to ask		
00% <score <="70%&lt;/td"><td>0000</td><td colspan="3">questions, make your students think</td></score>	0000	questions, make your students think		
700% < Score < $-800%$	Between Good & Very	The influence of a good teacher can never be erased,		
70% Score <- 80%	Good	keep motivating		
$900/ < S_{20} = -950/$	Varu Cood	A very good teacher knows how to bring out the best,		
00% <scole <="03%&lt;/td"><td>very Good</td><td>keep it up</td></scole>	very Good	keep it up		
85% < Secre < -0.5%	Between Very Good &	An inspiring teacher has lasting influence, you deserve		
0570 <scole <-95%<="" td=""><td>Excellent</td><td>to be one</td></scole>	Excellent	to be one		
$S_{core} > 05\%$	Excellent	An excellent teacher is the heart of education, keep the		
50010 > 7570	Excentin	good work going		

Table 2 : Qualitative feedback based on the quantitative % Gross Weightage Score

From figure 2, one can easily appreciate that a teacher possessing 'very good' knowledge (here, 80%) may not be overall rated as very good in teaching since the other two domains of attitude and skill (here, 38% & 28% respectively) are not found to be desirable. As such, we find here that the gross weightage score of the concerned teacher's performance is 49%, indicating a below 'good' level of teacher effectiveness, as shown in table 2 earlier.

However, the case shown in figure 3 is somewhat different and quite opposite of that shown in figure 2. Here, the knowledge component is 'satisfactory' (40%), but faculty performance shows a gross weightage score of 62% because of weightage skill (79%) and attitudinal (67%) components. Therefore, it needs no further elaboration that the understanding and expertise in pedagogy and subject matter, together with teachers' ability to apply effective instructional skills, are the keys to learning for all students for which attitude plays the foremost role.



#### Figure 2 : Final window of the MATLAB GUI (with sample data input)



Figure 3: Final window of the MATLAB GUI (with sample data input)

In order to use this GUI, the evaluator needs to have Matlab platform. The developed GUI can be used with the access of two developed GUI files, that is, 'm' file and one 'graphics' file. Hence, it has been mentioned earlier that even without the technical know-how of Matlab, this GUI tool can be used fruitfully, without hassle.

#### CONCLUSION

Effective teaching can be defined in several ways as discussed earlier. The effect of teaching on student outcomes can be diverse, viz., teaching can have an effect on learning in the cognitive domain, attitudinal component, skill development and even on the motivational upliftment of learners. Factors of classroom instruction like, adequate classroom management, systematic monitoring of students, well-structured lesson plans, timely & encouraging feedback, - all have a positive impact on learning achievement.

An important fact is that the teacher should not be aversive to feedback given by the senior authority, otherwise teaching becomes mechanical. Constructive feedback of any activity will always lead to improvement of the same. The rater who will evaluate the teacher also has to be enough knowledgeable about teaching and its effectiveness. In this paper, an attempt has been made to develop user friendly MATLAB GUI considering some limited but essential parameters based on Skill and Attitude domains for effective teaching. The mentioned list of parameters is not exhaustive. Improvement on the developed GUI may be made with rating on knowledge domain precisely.

Teacher effectiveness can be judged only by assessing the impact of teaching on students' learning. As such, the tool suggested has to be used only after the teacher has taught a group of students to study its effectiveness. Hence, this tool is only suggestive.

However, there are certain delimitations of the work. To mention a few, the validity and reliability of the instrument is yet to be established. As already stated, the comprehensiveness of the tool can also be increased. For any learning-teaching system, the evaluation framework needs to be clearly defined. The strategies and approaches, in this regard, are also essential to be mutually agreed upon by the evaluator and the individual to be evaluated. Though the knowledge component has not been elaborated in the list of parameters, this can be an area of research in itself. Further, the suggested tool needs to be administered and studied for its utility and impact.

#### ACKNOWLEDGEMENT

Authors<sup>1</sup> are grateful to Prof. Phalguni Gupta, Director, National Institute of Technical Teachers' Training & Research, Kolkata for providing academic motivation, library support and up-to-date infrastructural facilities. They<sup>2</sup> are also thankful to Prof. K C Ravishankar, Principal, Government Engineering College, Hassan for providing academic environment.

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# Examining the Core Competencies for Teacher Successat Different Levels Of K-12 Teaching

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#### "A teacher takes a hand, opens a mind and touches a heart" (Anonymous)

#### ABSTRACT

Teacher competencies, defined as the knowledge, skills and attitudes that a teacher should have in order to fulfill the teaching profession effectively and efficiently (MoNE, 2006), are of great importance in the teaching and learning process. The aim of this study is to identify the core competencies required for success for teachers who teach at three different levels (primary, middle-school and high school) in a prominent private K-12 school in Istanbul, Turkey. A focus group discussion using the card sort technique is employed in this study. A representative sample of 17 teachers (six from each of the primary and high school levels and five from the middle school level) comprise the study participants. The teachers, in three separate focus groups, chose the top five roles they fulfilled most from the role cards handed to them. After a discussion, they identified their top six indispensable roles and were then introduced to the competencies that were related with these roles. At this stage, all teachers separately rated each competency's importance and ranked it's priority as a success factor. From the focus groups; eight competencies were derived for the primary school teachers and seven competencies each for the middle and high school teachers as key elements of success. Three of the competencies were shared by all levels. This study's value lies in its defining the competencies required for success at the different levels of K-12 teaching. The identified competencies provide valuable criteria which can be used in teacher selection, performance evaluation, training and career development purposes.

Keywords: teacher competencies, K-12, card sort technique.

#### **INTRODUCTION**

The teaching profession is one of the most complicated and responsible fields of professional activity, as the job of teachers influences the lives, value orientations and the need for self-realization of many people (Aizsila, 2008). The focus on developing teacher competencies has its roots in the middle of the 20th century, when competency-based teacher education models became popular (Korthagen, 2004). According to the Australian Health Promotion Association, core competencies are what all practitioners are expected to be capable of doing in order to work efficiently and effectively (AHPA, 2004) and can thus give coherence to the practice of teaching. It is important that all teachers are equipped with strong professional competencies (Selvi, 2010). The concept of teacher competencies was recently defined by the Turkish Ministry of Education as the knowledge, skills and attitudes that a teacher should have in order to fulfill the teaching profession effectively and efficiently (MoNE, 2006). These "Generic Teaching Profession Competencies" were prepared under the coordination of The General Directorate of Teacher Training, within the scope of Support to the Basic Education Programme. During the process, self-evaluation surveys as well as observation and interview forms were applied to 2129 teachers who served at 72 pilot primary schools within Turkey. As a result, the generic teacher competencies which encompass the technical information, skills and attitudes all teachers should demonstrate, were defined as; Personal and Professional Values (Professional Development), Knowing the Student, Learning and Teaching Process, Monitoring and Evaluation of Learning and Development, School-Family and Society Relationships and Knowledge of Curriculum and Content. Moreover, these six main competencies consist of 31 sub-competencies and 233 performance indicators (MoNE, 2006). All of these competencies for teachers are expected to be used in; personal and professional developments of teachers, identifying teacher training policies, selection of newly assigned teachers, preparation of pre-service teacher training, programmes of higher education institutions training teachers, in-service training of teachers and evaluation of teacher performance and achievements.

As reflected in the Turkish Ministry of National Education research results, there are many factors that make teachers competent. These encompass the knowledge of subject area, personality traits, teaching learning skills, classroom management skills, planning and evaluation skills, use of technology, communication and guidance skills (Şeker, Deniz, Görgen, 2005). Thus, the generic teacher competencies defined above encompass what can be called the 'success profile' of a teacher. The global human resources consultancy firm DDI (Development Dimensions International) has coined the term 'success profile' and has created a holistic view of success (Figure 1), including - and expanding upon - competencies as traditionally defined. As can be seen on Figure 1, success profiles holistically capture the requirements of job success – what knowledge, experience, competencies, and personal attributes are critical to perform any job.



These profiles define what enables individual, group and eventually organizational success – or conversely, contributes to failure if lacking (Cosentino, Erker and Tefft, 2009).



Figure 1 Success Profiles (DDI, 2009)

In this study, we deliberately chose to concentrate on one of the quadrants of the success profile, namely 'competencies' since competencies can be observed, evaluated and most importantly they can be further developed. Moreover, we aimed to define the necessary competencies across different teaching levels to shed light on teacher competencies necessary for success at different levels of K-12 teaching in a Turkish educational institution. Thus, the current study aims to answer the following question: What core competencies are necessary for teachers' success at different levels of K-12 teaching?

#### METHOD

**Participants:** This study was conducted in a private K-12 school in Turkey which was established in 1963 first as a kindergarten and an elementary school and has now been transformed into an institution comprised of a primary, middle and high school. The educational philosophy of the school is based on the idea of its founder that, there is definitely an area in which every child is talented. This school is also one of the top schools in Turkey with regards to academic achievement.

A focus group discussion using the card sort technique was employed in this study. Invitations describing the aim of study were sent to teachers from different K-12 levels with expected performance to gain expert opinions on the topic. Participant teachers were selected from among those who were knowledgeable, could provide valuable input in the process and were interested and dedicated in their field of study/practice. The aim was also to select participants who could provide various perspectives and provide a variation in responses about all the possible competencies deemed important for different levels of K-12 teaching.

A representative sample of 17 teachers (six each from each of the primary and high school levels and five from the middle school level) from out of a total of 120 comprise the study participants. The study participants had a mean tenure of 8.5 years at their current institution. The participant information is presented in Table 1.



Table 1. Participant Information		
	Participants	
Gender	Male	7
	Female	10
	Total	17
Mean Age		38,5
Mean Tenure		8,5
Education Level	Ph.D.	-
	Masters	-
	Bachelor Degree	17
Education Level Taught	Primary School	6
8	Middle School	5
	High school	6
Subject Taught	Foreign Languages	2
U C	Chemistry	1
	Geography	1
	Science	1
	Turkish Literature	1
	Math	3
	Counseling	1
	Class teacher	6
	Physical Education Teacher	1

**Measurement:** The role cards used in the study are the product of 40-plus years of research, developed by the human resources consultancy firm Development Dimensions International (DDI) — applied and validated— across nearly every job, level, and industry around the world (Cosentino, Erker and Tefft, 2009).. This card sort process helps content experts articulate the critical challenges of a given role and define the competencies required for success in the job. The card sort process was chosen as the method of study since it offers the means to identify the job requirements, using highly structured language with clear links to specific competencies. The theoretical study model is depicted on Figure 2 below.



#### Figure 2. Theoretical Structure to Define Teacher Roles and Related Competencies

**Procedure:** At the beginning of the card sort sessions, the moderators explained to the participants that the aim of the research was to identify the competencies necessary for success for a teacher at their position. Thus, the central question for discussion between the teachers who participated in the card sort groups was the following: Which roles are indispensable/critical for your current job as a teacher and which roles do you most frequently display? During the discussions, the moderators were able to introduce other follow up questions that they considered could help participants to elaborate their views.

The 17 participants took part in three separate focus groups of five to six participants each, where they were instructed to choose the top five indispensable roles they fulfilled most from the role cards handed to them. To assess the indispensable roles they currently display, the participants were first instructed to sort the 32 role cards into one of the three categories of "high importance", "middle Importance" and "low Importance". They were then instructed to disregard those cards which were in the middle and low importance groups and prioritize the top five cards in their high importance column. Each participant's top five roles were then entered into the cardsort excel spreadsheet and a final list of the roles with their mean rankings, standard deviations and the number of votes they received was reflected in the spreadsheet. After a group discussion upon the roles deemed most important for them, the groups agreed upon their top six indispensable roles that they demonstrated most frequently. After these six roles were entered into the spreadsheet, the system brought forth the competencies that were related with these six roles identified bu the teachers. At this stage, first the moderators explained the meaning and the related key actions of each competency to the participants. Afterwards, all teachers separately rated each competency's importance on a 1 to 5 scale ("1= this competency is not at all important for success in this job", "5=this comptenecy is very important for success on this job") and also prioritized them in terms of being a success factor for a competent teacher (assigning number one to the most important competency and moving on in this fashion to the next competency that had the second priority). Finally, the average mean and rank for each competency was calculated and those competencies above the designated cut off point (those with a mean value of 3.5) were included in the final competency list along with their key behavioral actions. This cut off point was deemed necessary, since at the individual role level, a total of seven to nine competencies are deemed enough to achieve desired work related results and it becomes harder to demonstrate, evaluate and develop a higher number of competencies at this role (Byham, Smith and Paese, 2002).

#### FINDINGS

The final list of role cards chosen by the three levels of teachers are presented in Figure 3 below. As can be seen, there are some overlaps between the cards chosen by the different levels of teachers. For instance, Continuous Learner and Tenacious role cards were chosen as indispensable by all of the three levels of teachers. Moreover, some role cards were shared by the two different levels' teachers; such as Change Agent and Planner (for both primary and middle school teachers), Researcher (for primary and high school teachers); and Active Team Member (for middle and high school teachers).

Primary School Teachers	Middle School Teachers	High School Teachers
Continuous Learner Change Agent	Active Team Member Continuous Learner	Continuous Learner Researcher
Researcher	Tenacious	Active Team Member
Planner	Change Agent	Tenacious
Moderator/Instructor	<b>Results Focused</b>	Writer/Editor
Tenacious	Planner	Presenter

#### Figure 3. Top Six Role Cards Chosen by the Three Levels of K-12 Teachers

The data regarding the mean rankings, standard deviations and total number of votes given to the final list of role cards for the three levels can be viewed on Tables 2, 3 and 4 below.

Table 2 List of Top Six Role Cards for Primary School Teachers			
	Mean	Standard	Total
List of Role Cards	Ranking	Deviation	votes



Continuous Learner	2,67	0,84	5
Change Agent	3,17	1,95	5
Researcher	4,33	1,41	4
Planner	4,83	0,58	3
Moderator /Instructor	5,17	1,53	3
Tenacious	5,33	1,53	3

#### Table 3 List of Top Six Role Cards for Middle School Teachers

List of Role Cards	Mean Ranking	Standard Deviation	Total Votes
Active Team Member	3,60	1,67	5
Continuous Learner	3,60	0,58	3
Tenacious	4,00	1,71	4
Change Agent	4,40	0,58	3
Results Focused	4,60	1,73	3
Planner	5,20	0,71	2

#### Table 4 List of Top Six Role Cards for High School Teachers

List of Role Cards	Mean Ranking	Standard Deviation	Total Votes
Continuous Learner	3,17	1,67	5
Researcher	3,83	1,89	4
Active Team Member	4,00	1,29	4
Tenacious	4,67	1,29	4
Writer/Editor	5,17	1,53	3
Presenter	5,17	1,15	3

After their most indispensable roles were determined by the three levels of teachers, these were entered into the spreadsheet and as an output, the competencies related with these roles were introduced to the participants. At this stage, the moderators provided the participants with competency booklets to read about the definitions of these competencies and their key actions. After a discussion about these competencies and their behavioral components, the participants were asked to rate both the importance (out of a 1 to 5 scale as mentioned above) and rank the priority of these in order of importance as a success factor for their position. The points for each competency were summed up and their mean values were calculated for all experts. As the aim for this round was for participants to rank the competencies, the mean was an appropriate measure to use in order to ascertain the average points each competency achieved. A mean of 3.5 was employed as a cut-off point and this resulted in seven competencies achieving this mean for each of the primary, middle and high school teachers. However, during the final discussion about competencies, the primary school teachers stated that Energy was a crucial competency for their position and decided to add this competency to their final list at this stage. Hence, the final competency lists contained eight competencies for the primary school teachers and seven competencies each for the middle and high school teachers. Further statistical testing was not employed due to the low number of participants and the nature of the study design. The mean ratings and rankings of the final list of competencies (along with their key action summaries) for the three levels can be viewed on Tables 5, 6 and 7 below.



# Table 5. List of Competencies for Primary School Teachers

List of Competencies and Their Key Action Summaries	Mean Rating	Mean Ranking
Communication	5	2,67
Clearly conveying information and ideas through a variety of written and verbal media to students, parents and colleagues in a manner that engages the audience and helps them understand and retain the message.		,
Building Trust	5	3,5
Interacting with students, parents and colleagues in a way that gives them confidence in one's intentions and those of the organization; demonstrating an ethical attitude and professional behavior that reflects responsibility.		
Student Focus	5	3,83
Making students and their needs a primary focus of one's actions; developing and sustaining effective relationships with students.		
Planning and Organizing	4,83	5,33
Making plans and organizing work to carry out work effectively and support student learning processes and social development.		
Continuous Learning	4,17	9,17
Actively identifying new areas for learning; regularly creating and taking advantage of learning opportunities; using newly gained knowledge and skill on the job and learning through their application.		
Building Positive Relationships	4,17	10
Using collaborative interpersonal styles to establish effective relationships with colleagues, parents community figures in order to help achieve teaching aims.		
Adaptability	4,67	11,5
Aligning teaching methods and processes with diverse needs, interest and skill levels of students in order to achieve teaching aims.		
*Energy		
Consistently maintaining high levels of activity or productivity in the educational setting; sustaining long working hours to achieve teaching aims; operating with vigor, effectiveness, and determination over extended periods of time.		

\*The Energy Competency was not derived from the card sort study, but the primary school teachers wanted to add it to their final list during the final discussions about competencies.

#### Table 6. List of Competencies for Middle School Teachers

List of Competencies and Their Key Action Summaries	Mean Rating	Mean Ranking
Communication	4,6	3,8
Clearly conveying information and ideas through a variety of written and verbal media to students, parents and colleagues in a manner that engages the audience and helps them understand and retain the message.		
Contributing to Student Success	4,2	6,4
Collaborating with students and actively contributing to the achievement of students' social and academic aims.		
Adaptability	4,2	7,8
Aligning teaching methods and processes with diverse needs, interest and skill levels of students in order to achieve teaching aims.		
Energy	4,2	8



Consistently maintaining high levels of activity or productivity in the educational setting; sustaining long working hours to achieve teaching aims; operating with vigor, effectiveness, and determination over extended periods of time.

Continuous Learning	3,8	8,8
Actively identifying new areas for learning; regularly creating and taking advantage of learning opportunities; using newly gained knowledge and skill on the job and learning through their application.		
Work and Time Management	4,2	9
Using time effectively during teaching and learning processes and guiding students to use their time effectively during in and out of class activities.		
Work Quality	3,8	11
Setting high performance standards for oneself and one's students; taking responsibility to fulfill tasks and projects with success and to internalise and apply the school's quality standards.		

#### Table 7. List of Competencies for High School Teachers

List of Competencies and Their Key Action Summaries		Mean Ranking
Continuous Learning	4,33	3
Actively identifying new areas for learning; regularly creating and taking advantage of learning opportunities; using newly gained knowledge and skill on the job and learning through their application.		
Communication	4,33	6
Clearly conveying information and ideas through a variety of written and verbal media to students, parents and colleagues in a manner that engages the audience and helps them understand and retain the message.		
Contributing to Student Success	4	6,17
Collaborating with students and actively contributing to the achievement of students' social and academic aims.		
Work Quality	4,33	6,67
Setting high performance standards for oneself and one's students; taking responsibility to fulfill tasks and projects with success and to internalise and apply the school's quality standards.		
Adaptability	4,17	6,83
Aligning teaching methods and processes with diverse needs, interest and skill levels of students in order to achieve teaching aims.	-	
Stress Tolerance	4	8,67
Maintain a stable performance under pressure or during times of conflict; cope with stress in an acceptable manner within the school environment.		
Work and Time Management	3	11,67
Using time effectively during teaching and learning processes and guiding students to use their time effectively during in and out of class activities.	-	

#### DISCUSSION

As can be seen from the results, similar to the role cards, there are some overlaps between competencies from different levels. For instance; the competencies of Communication, Continuous Learning and Adaptation are deemed as crucial for all three levels of K-12 teachers. Middle school and high school teachers seem to value many common competencies as crucial for teacher success, with the exception of Enery being specific to the middle school and Stress Tolerance being specific to the high school level. Moreover, there are four competencies that are unique to the primary school level only which are; Building Positive Relationships,



Building Trust, Planning and Organizing and Student Focus. A summary of the competency clusters and these overlaps is demonstrated on Figure 4 below.



# Figure 4 Competency Clusters for K-12 Teachers

Moreover, when we look at the top three competencies which have the highest ratings and rankings at the three levels, we see that, Communication has the first place for the primary and middle school levels and is also the second highest rated and ranked competency for the high school level. Thus, at the three separate levels of K-12 teaching, Communication seems to be one of the most crucial competencies. In addition to this, Contributing to Student Success has emerged as the second highest rated and ranked competency for the middle school level and the third highest for the high school level. A very similar competency, Student Focus, has also the third place for the primary school level. Hence, demonstrating good communication skills as well as student centered behaviors and facilitation skills emerge as a prominent competencies for all of the three levels.

The competencies that DDI has found to be commonly related to success in a position fall into four domains: Interpersonal Skills, Leadership Skills, Business/Management Skills and Personal Attributes (Byham, Smith and Paese, 2002). DDI research, in addition to research done by Borman and Brush (1993) suggests that related competencies make up these four primary competency domains. Interpersonal Skills are behaviors associated with interacting with others, such as Communicating and Developing Relationships. Leadership Skills are behaviors associated with leading others, such as Coaching/Teaching and Empowerment. Business/Management Skills are behaviors associated with the business or technical aspects of one's role, such as Decision Making. Finally, Personal Attributes are stable individual attributes, abilities, or orientations, such as Positive Disposition, Adaptability, and Energy (Byham, Smith and Paese, 2002).

Thus, when we look at the competency clusters for the three levels of K-12 teaching, we can also group these competencies fall under one of of these four domains. The primary school card sort results point out that, there are eight crucial competencies for a teacher's success at this level of teaching, which are; Student Focus, Planning and Organizing, Communication, Building Positive Relationships, Building Trust, Continuous Learning, Adaptation and Energy. Out of these competencies, Student Focus falls under the domain of Leadership Skills; Planning and Organizing falls under the domain of Business/Management Skills;



Communication, Building Positive Relationships and Building Trust fall under the domain of Interpersonal Skills and the last three competencies of Continuous Learning, Adaptation and Energy fall under the domain of Personal Attributes. As can be seen from this allocation, most of the primary school competencies derived from this study fall under the domains of Interpersonal Skills and Personal Attributes. This is a valuable finding since, especially at this developmental level, the type of personal attributes and relationship building capabilities a teacher has is of utmost importance to the students. A teacher's personality also has a significant role in maintaining an effective teaching and learning process. A teacher must have good communication and personality characteristics that facilitate learning (Tatar, 2004), since students first of all like the teacher and then subsequently like the course especially at primary school ages. Previous studies also point out that, in addition to their academic knowledge and success, it is also expected that teachers demonstrate positive attitudes and personality traits (Aydın, Bavlı & Avcı, 2013; Sümbül, 1996).

For the middle school level, the following seven competencies were identified; Contributing to Student Success, Work and Time Management, Work Quality, Communication, Continuous Learning, Adaptation and Energy. Out of these competencies; Contributing to Student Success falls under the domain of Leadership Skills, Work and Time Management and Work Quality fall under the domain of Business/Management Skills, Communication falls under the domain of Interpersonal Skills, and the last three competencies of Continuous Learning, Adaptation and Energy fall under the domain of Personal Attributes. When we compare the competencies in the primary and middle school levels, we can see that Student Focus at the primary school level evolves into Contributing to Student Success at the middle school level whereby the teacher takes on more of a moderator role. Moreover, under management skills at the middle school level, we see two new competencies; one of which is Work and Time Management. This competency encompasses the Planning and Organizing competency that was derived for the primary school level, but it also incorporates time management. The other competency under this domain is Work Quality, which is about aiming and maintaining high standards in one's own and one's students' performance. Under the Interpersonal Skills domain, at this level we only see the Communication competency. The competencies under the Personal Attributes column are the same ones that are derived for the primary school level. So, it can been seen that, at the middle school level, the competencies are evolving to become more comprehensive and work-oriented (as opposed to relationship-oriented) when compared to the primary school level.

Finally, for the high school level, the following seven competencies were identified; Contributing to Student Success, Work and Time Management, Work Quality, Communication, Continuous Learning, Adaptation and Stress Tolerance. Out of these competencies, Contributing to Student Success falls under the domain of Leadership Skills; Work and Time Management and Work Quality fall under the domain of Business/Management Skills; Communication falls under the domain of Interpersonal Skills and the last three competencies of Continuous Learning, Adaptation and Stress Tolerance fall under the domain of Personal Attributes. The competency list is almost identical with the one that is derived for the middle school level with the exception of Stress Tolerance which replaces Energy, under the heading of Personal Attributes. Energy is about consistently maintaining high levels of activity or productivity and operating with vigor, and effectiveness over extended periods of time. Stress Tolerance however, is about maintaining a stable performance under pressure or during times of conflict and coping with stress in an acceptable manner within the school environment. This is understandable given the fact that students at the high school level are at the adolescence stage of development and are busily redefining their identities in ways that incorporate the various changes occurring in their minds and bodies (Santrock, 2002). Unquestionably, this is a psychosocial stage that entails a time of stress, confusion and identity search for the students, and it is indeed crucial that the teacher at this level displays Stress Tolerance as a competency.

The competencies identified as important for teachers' success in this study also overlap with some of those identified through the Ministry of National Education project carried out in Turkey (MoNE,2006). For instance, the generic competency of Personal and Professional Values entails efforts to attain high level of syudent learning and development by taking into account social and cultural differences of students as well as engaging in one's self-development as a teacher. This generic competency encompasses the Student Focus, Contributing to Student Success, Adaptation and Continous Learning competencies derived in the present study. Similarly, the generic competency of Knowing the Student, which entails knowing all the characteristics, interests and needs of the students and understanding their socio-cultural and economic backgrounds overlaps with again Student Focus, Adaptation and Building Trust. The generic competency of Teaching and Learning Process is about planning and managing the teaching and learning process and ensuring active involvement of students in this process. This competency is very similar to Planning and Organizing and Work and Time Management derived in this study. Moreover, the generic competency of Monitoring and Evaluation of Learning and Development which is about evaluating the development and achievement of students with regard to learning is similar to the Work Quality competency identified here. The generic competency of School, Family and Society Relationsips



is about knowing and encouraging the families and community to participate in the training process and school development activities, and it is very similar to the competency of Building Positive Relationships. The final generic competency of Knowledge of Curriculum and Content is about using the principles and techniques of the subject-specific curriculum was not a point of discussion in the focus groups of this study, since this section was deemed as the technical knowledge domain of the success profile before the discussions began and was deliberately left out. The Communication competency derived in this study represents a common thread in all of the generic competencies defined by the Ministry of National Education research results. Thus, it can be seen that with the exception of a few specific competencies (Energy and Stress Tolerance), the results of the present study mostly concur with the generic competencies identified by MoNE (2006).

Similarly, assessing the situation in Turkey, in 2009, Turkish Educational Foundation (TED) suggested some teacher standards and competencies. According to these, teachers should be dedicated to; students and their learning, technological pedagogical content knowledge, instructional planning and implementation, evaluation and monitoring, providing of an effective communication in teaching and learning environment and managing student behavior, planning personal and professional development and implementation and working in partnership with other teachers, parents and school staff, teamwork and cooperation, as well as knowledge and understanding of the legislation related to professional duties and work (TED, 2009). Moreover, in the YÖK (Turkish Higher Education Council) guidelines for teacher proficiency the following components; knowledge of subject matter, planning the learning and teaching process, classroom management, effective communication skills, effective evaluation and feedback, updating one's professional development are mentioned (1998). As can be seen, there are many parallel competencies with the Turkish Educational Foundation's suggestions, The YÖK guidelines for teacher proficiency and the results of this study. Still, a value added by this study is the identification of competencies specific to the three levels of K-12 teaching, which sheds a new light on the competent teaching behavior patterns for K-12 different levels.

Moreover, on a global scale, the European Commission report on 'Supporting Teacher Competence Development for Better Learning Outcomes' (2013) draws on the work of the thematic working group 'Teacher Professional Development' which comprises experts nominated by 26 European countries, and stakeholder organisations. According to this report, teachers' competences can be outlined in six broad paradigms which are; the teacher as a *reflective agent*, the teacher as a *knowledgeable expert*, the teacher as a *skilful expert*, the teacher as a *classroom actor*, the teacher as a *social agent*, the teacher as a *lifelong learner* (Paquay & Wagner, 2001). The content of these broad headings has many parallel features with the generic teacher competencies identified by the Turkish Ministry of Education Study (MoNE, 2006) as well as with the results of this study.

#### CONCLUSION

Teaching serves a crucial function for society, since it is the teachers who by building various skills and competencies and promoting a societal, historical and cultural understanding, shape the future of every nation. Thus, identifying and developing the right competences for teachers is a task of utmost importance. Taking this view as a starting point, this study, aimed to examine core competencies necessary for teachers' succes at a deeper level, namely the three separate levels of K-12 teaching.

The roles of teachers and schools are changing, and so are expectations about them; teachers are asked to teach in increasingly multicultural classrooms, integrate students with special needs, use ICT for teaching effectively, engage in evaluation and accountability processes, and involve parents in schools (OECD, 2009). Furthermore, a recent World Summit on Teaching noted that teachers need to help students acquire ways of thinking (creativity, critical thinking, problem-solving, decision-making and learning); ways of working (communication and collaboration); tools for working (including information and communications technologies); and skills around citizenship, life and career and personal and social responsibility for success in modern democracies (Schleicher, 2012). According to a recent European Commission Report (2013) titled 'Supporting teacher competence development for better learning outcomes', teaching requires complex and dynamic combinations of knowledge, skills, understanding, values and attitudes and that their acquisition and development is a career-long endeavour that requires a reflexive, purposeful practice and high quality feedback.

The quality of an education system depends ultimately on the quality of its teachers (Barber & Mourshed, 2007) and teacher competence frameworks, when devised and implemented in ways that are relevant to each national context and consistent with other educational policies, can be powerful tools to improve educational quality. The development of competency frameworks can also be used in order to strengthen teachers' professional practice, by using it to inform teacher education curriculum as well as serving as a 'self-orientation and development tool' for teachers (Pantic & Wubbels,2010). As Molenaar, Zanting and Van Beukelen (2009) have stated, there are many ways in which a teacher competency framework can be used. For example, teachers can use the framework to help to define their roles and responsibilities, to self-assess and to guide their professional development



activities. Staff developers can also use a framework of educational competencies to help to structure both formal (e.g. workshops) and informal (e.g. peer coaching) professional development activities. Thus, in many ways, a framework for teaching competencies can help to define standards, facilitate assessment and accountability, and promote the professionalization of teaching (Steinert,2009).

The study reported here is a preliminary step in conceptualising teacher competencies in a private K-12 school in İstanbul, Turkey. While the intention is not to generalize from the data presented in this study, nonetheless it provides some insight in informing others who may seek to undertake an analysis of what it means to be an effective educator at different levels in K-12 schools. Therefore, it is hoped that the results will provide an impetus for future research in the domain.

There clearly is significantly more work to be done in order to contribute to a coherent body of knowledge in this field. For instance, it is imperative that research is conducted to listen to the voices of teachers from various other private and public schools and also their students in order to ascertain what they believe are the necessary competencies for success as a teacher in schools. It should also be further explored whether achievement of competencies leads to competence on the part of students.

Thus, if teachers are there in order to facilitate the development of future citizens — not just literate and numerate individuals, but critical thinkers, socially just actors, and innovative creators — then perhaps there is no real way to measure their effectiveness while their students are still at school. Perhaps, in the end, the school's alumni are actually best placed to nominate the best teachers (Measham, 2011).

#### LIMITATIONS

A focus group study, using the card sort method was used in this study. There are a number of disadvantages to the focus group method, including limited reliability and validity, and various forms of moderator and respondent bias (Drayton, Fahad and Tynan 1989). Focus groups are unlikely to be the method of choice when statistical data and generalizable findings are required: samples are usually small and unrepresentative, and it is difficult to make a good theoretical case for aggregating data across a number of diverse groups, or for making direct comparisons between groups.

In addition to the above limitation, the participants selected to partake in focus group studies, are often viewed as a potential limitation (Linstone, 1975) and it is acknowledged that the presence of a subjective selection process as may have led to potential selection bias. Thus generalisations from this study cannot be made to larger populations.

#### SUGGESTIONS FOR FUTURE RESEARCH

In the future, standards for acceptable teacher performance for different levels of teaching need be developed to better serve the needs of students at different levels of development.

Additionally, research might investigate whether perceived teacher competencies to facilitate reflective learning are related to students' improvement in various competencies, as well. Moreover, It is imperative that further research includes students' perspectives on this topic.

#### ACKNOWLEDGEMENTS

The author gratefully acknowledges the contribution of the teachers and founders of the K-12 school who took part in the research study and shared their perceptions and ideas in a positive and collaborative manner. Special thanks are for Can Vuran, one of the school's founders who initiated this study and was a major impetus throughout.

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# **Exploring the Multivariate Aspects of the Proactive Coping Inventory**

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#### ABSTRACT

The purpose of the present study was to test whether the relationships between the observed proactive coping variables as measured by PCI (Greenglass et al., 1999) and their underlying constructs exist in a priori manner, as the theory would seem to indicate. The psychometric properties for each dimension of the PCI were evaluated using a number of confirmatory factor analyses (CFAs) on a medium-size sample (n = 447). After the individual one-factor models were assessed as factorially valid, a combined model could be evaluated. The original 7-factor model (as well as 5-, 4- and 3-factor models) was tested. Based on the results, the 7-factor model best represented the data:

- (1) Proactive Coping,
- (2) Preventive Coping,
- (3) Reflective Coping,
- (4) Strategic Planning,
- (5) Instrumental Support
- (6) Emotional Support and
- (7) Avoidance Coping.

#### **INTRODUCTION**

There are many challenges to be faced in contemporary society, including the stresses of everyday living and newly rising challenges in patterns of professionality, required job skills and soft skills. For this reason, symptoms of depression and lower self-esteem are being experienced not only in working society but also in those who are about to enter the labor market and integrate with society. The research for effective ways to reverse this trend has resulted in a significant shift in psychological approach from a focus on weaknesses and pathology to a more positive focus on the emphasis of health, personal growth and individual strength. This study contributes to our understanding of how people in different social backgrounds meet life challenges. If a given stressful event is still at its early stages, coping strategies become increasingly meaningful and necessary, as they can serve as a protective factor against possible failure. In doing so, the individual attempts to build up general resources and the process of coping with potential stress and difficult situations in the distant future both ensure personal growth and provide an opportunity for actualization of one's full potential. At this point we must make a distinction between traditional coping models as offered by Folkman and Lazarus (1985) and proactive coping. Studies that underline positive aspects of coping use the proactive coping concept to deal with a future-oriented and positive approach to coping (Schwarzer & Taubert, 2002).

The essence of proactive coping is inclusion of future aspects which can potentially lead to further self-development and self-regulation. Such definition of proactive coping differs from the originally/traditionally understood coping of <u>Aspinwall and Taylor (1997)</u>, who were some of the first who used the term "proactive coping" in this context. However, the author definition corresponds more to the concept of preventive coping in connection with difficult situations, i.e., a solution that anticipates potential stress and is held in advance in order to prevent stressful situation or to minimize its negative consequences.

<u>Greenglass</u>, <u>Schwarzer and Taubert (1999)</u> developed the Proactive Coping Inventory (PCI), a widely used research tool that reflects the effort expended before the stressful situation occurs. Proactive coping is, according to <u>Greenglass et al. (1999)</u>, multidimensional and forward-looking, combining processes aimed at improving the quality of life and those aimed at achieving self-regulatory set goals. The authors distinguish the traditional understanding of proactive coping in the three main areas: (1) Traditional coping is a reactive response to
situations that have already happened. Proactive coping is, by contrast, oriented towards the future. Its purpose is to create a resource for personal growth and achievement of the autonomously set goals. (2) Another difference in the definition of proactive and reactive coping is that proactive coping is focused on goals achievement rather than on reducing threats or negative risks. (3) Motivation of proactive coping is positive, the ability to perceive the situation as an opportunity for personal growth and an additional challenge to overcome personal obstacles. The PCI consists of seven dimensions that are covered by 55 items. Briefly characterized, the Proactive Coping subscale represents self-regulatory goal-setting and goal-attainment (i.e., "I like challenges and beating the odds"). Preventive Coping subscale reflects a potential threat in future (i.e., "I think ahead to avoid dangerous situations"). Reflective Coping subscale captures the thinking of the possible variants of behavior, comparing their effect and creation of further steps (i.e., "I imagine myself solving a difficult problem before I actually have to face it"). Strategic Planning subscale represents layout of actions needed to achieve the goals and tasks division into a smaller manageable units. (i.e., "I break down a problem into a smaller parts and so one part at a time"). Instrumental Support Coping subscale (i.e., "When I am in trouble I can usually work out something with the help of others") and Emotional Support Coping subscale (i.e., "I know who can be counted on when the chips are down") includes obtaining advice, information and feedback from other people and help and support from significant others. The last, Avoidance coping subscale, represents a passive approach to solving stress (i.e., "When I have a problem I usually let it simmer on the back burner for a while").

The proactive coping is becoming a well-researched concept, especially in English speaking countries. <u>Solcová</u>, <u>Lukavský and Greenglass (2006)</u> organized the first validation study using the PCI in the Czech educational environment. The psychometric properties of the inventory were comparable with the original version of the PCI. Using a medium-size student sample (n = 176), the original 7-factor model as well as an alternative 3-factor model were checked. The 3-factor model included the following factors: (1) Preventive, Reflective and Strategic Coping, (2) Emotional and Instrumental Support and (3) Proactive and Avoidance Coping. All items, except for one, loaded significantly on the relevant factor. Item 8 (*I try to let things work out on their own*) from the Proactive Coping subscale did not significantly load on the appropriate factor. EFA and CFA on the same data set were employed and the obtained data favored the original 7-factor model on a sample of the university students.

The context in which research on proactive coping has been carried out highlight the positive effect of proactive coping on life management. Gan, Hu and Zhang (2010) compared the relative importance of proactive coping and preventive coping in students' adjustment to university life and evaluated the function of proactive coping in the stress process. The results suggested that stress has a mediating effect between proactive coping and maladjustment but not between preventive coping and maladjustment. Likewise, Gan, Yang, Zhou and Zhang (2007) found that proactive coping fully mediated the relationship between stress and student engagement. Within another context, Greenglass, Fiksenbaum, and Eaton (2006) examined the use of proactive coping in an elderly population and its relationship to feelings of depression and functional ability. Results showed that proactive coping was negatively associated with functional disability and with depression. Similarly, Li and Miller (2017) explored the impact of coping and resilience on anxiety among older Australians. Furthermore, proactive coping facilitated the processes aimed at maintaining or improving the quality of life, such as overcoming a gambling disorder (Sleczka, Braun, Grüne, Bühringer, & Kraus, 2016), chronic pain (Adamcová, Knotek, & Raudenská, 2016) or coping with a limb amputation (Solgajová, Sollár, & Vörösová, 2015). However, the presented results are in agreement with existing literature on the positive nature of proactive coping, the measures of the proactive coping considerably varied across studies, samples and statistical procedures employed.

The purpose of the present study was to test the hypothesis that a relationship between the observed proactive coping variables as measured by PCI and their underlying constructs exists in a priori manner as theory suggests. The psychometric properties for each dimension of the PCI were evaluated using a number of confirmatory factor analyses (CFAs). First, individual one-factor models for each PCI subscale were tested to confirm their unidimensional factor structure. Further, multiple-factor models were assessed to examine the intercorrelations among the original-factor structure of the PCI. An adjusted model was calculated in situations when the model did not fit with the expected level. In this case, the adjusted model took into account covariances between error



terms associated with a modification index above 10. The best-fitting factorial model was re-tested with fewer factors and internal consistency was checked.

## METHOD

## **Participants**

Four hundred forty-seven university students enrolled in a traditional face-to-face course delivery format in a medium-sized public university in the Czech Republic participated in the current study. 89% (398) were female and 11% (49) were male with the overall mean age of the sample at 20.92 years (SD = 2.07), ranging from 18 to 49 years. The majority of students studied full-time bachelor's degree (414, 93%) and master's degree (33, 7%) in the field of helping professions. 25% (113) of students had chosen Social Education for their specialization, 22% (99) of students had studied Preschool Teachers' Training and English for Business Administration. 13% of students had chosen General Nursing, 9% and 8% of students had studied Midwifery and Health and Social Care Worker respectively.

#### Measures

The Czech version (Solcová et al., 2006) of the Proactive Coping Inventory (PCI; Greenglass et al., 1999) was administrated to respondents. The PCI consists of a total of 55 items covering seven subscales: Proactive Coping (14 items;  $\alpha = .85$ ), Preventive Coping (10 items;  $\alpha = .83$ ), Reflective Coping (11 items;  $\alpha = .79$ ), Strategic Planning (4 items;  $\alpha = .71$ ), Instrumental Support (8 items;  $\alpha = .85$ ), Emotional Support (5 items;  $\alpha = .73$ ) and Avoidance Coping (3 items,  $\alpha = .61 - .74$ ). The original measure shows a reasonably good degree of factorial validity and internal consistency measured by Cronbach's alpha coefficient (Greenglass et al., 1999; Greenglass, 2002).

A four-point Likert scale ranging from 1 (*not at all true*) to 4 (*completely true*) was used. The high scores on the PCI subscales are seen as having beliefs that are rich in potential for change particularly in ways that would result in improvement of one's life and environment. The PCI subscale items were randomly dispersed within their respective questionnaires. However, the presented numbers of the items in this study correspond to the original order of the PCI.

#### RESULTS

#### **Data Preparation**

During a traditional face-to-face course, a paper-and-pencil questionnaire administration was used. Respondents were asked to participate voluntarily in the anonymous survey. Missing values were handled using the Expectation Maximization (EM) technique and multivariate outliers were detected by Mahalanobis distance values. All influential outliers above the critical chi-square value were removed from further analyses.

#### Procedure

The minimal requirements for a good model of fit using CFA were non-significant fit statistic  $x^2$  that says that the model is not different from the default. However, the  $x^2$  statistics are very sensitive to sample size and no longer relied upon as a basis for acceptance or rejection (Vandenberg, 2006). A chi-square to degrees of freedom ratio ( $x^2$ /df) of less than 5, ideally less than 3 and their goodness of fit (GOF) indices: a Root Mean-Square Residual (RMR) of .50 or less, a Root Mean Square Error of Approximation (RMSEA)  $\leq$  .05 indicates close approximate fit. A Goodness-of-fit Index (GFI) and Adjusted Goodness-of-fit Index (AGFI) of .85 or greater and a p of Close Fit (PCLOSE) greater than .05 are heuristic values that indicate that the model fits the data well. The internal consistency was examined by coefficient Cronbach's alpha ( $\alpha$ ) and intercorrelations were investigated using Spearman rank order correlation coefficient. IBM SPSS v. 22 and AMOS v. 21 were used.

#### **Confirmatory factor analysis**

The PCI subscales were originally developed using statistical techniques such as Pearson product-moment correlation coefficient, CFA, principal component analysis and reliability procedures – although it is not clear whether the scales were tested as one-factor model for each scale of the PCI, and/or whether they were tested within the multi-dimensional structure. The following analysis captures a logical practices chronology consisting of testing the hypothetical structure of the observed variables and their underlying latent constructs. The

researcher used knowledge of the theory and empirical research and tested the hypothesis using CFA on one-factor models. When each factor can be confirmed, then a combined model can be evaluated. According to the results (see Table 1), a one-factor solution representing each subscale of the PCI fit the expected level after all appropriate error covariance were added.

Error covariance (>10)	Range of factor loadings	α
e1 – e13; e2 – e4, e12, e14; e4 – e9;	.10 (item 8) –.68 (item 55)	.786
e5 - e10; e6 - e9; e9 - e13		
e1 - e3, $e7$ ; $e2 - e5$ , $e10$ ; $e5 - e9$ ; $e6 - e7$	.10 (item 39)68 (item 43)	.737
e2 - e4, e7; e5 - e10; e6 - e8	.37 (item 9)68 (item 42)	.793
e2 - e4	.26 (item 10)96 (item 17)	.555
e1 - e3; e2 - e7; e3 - e7	.33 (item 26)73 (item 44)	.781
e3 - e4; e4 - e5	.51 (item 32)78 (item 20)	.751
Just-identified model	.56 (item 14)77 (item 21)	.701
	Error covariance (>10) e1 - e13; e2 - e4, e12, e14; e4 - e9; e5 - e10; e6 - e9; e9 - e13 e1 - e3, e7; e2 - e5, e10; e5 - e9; e6 - e7 e2 - e4, e7; e5 - e10; e6 - e8 e2 - e4 e1 - e3; e2 - e7; e3 - e7 e3 - e4; e4 - e5 Just-identified model	Error covariance (>10)Range of factor loadings $e1 - e13; e2 - e4, e12, e14; e4 - e9;$ .10 (item 8)68 (item 55) $e5 - e10; e6 - e9; e9 - e13$ .10 (item 39)68 (item 43) $e1 - e3, e7; e2 - e5, e10; e5 - e9; e6 - e7$ .10 (item 39)68 (item 42) $e2 - e4, e7; e5 - e10; e6 - e8$ .37 (item 9)68 (item 42) $e2 - e4$ .26 (item 10)96 (item 17) $e1 - e3; e2 - e7; e3 - e7$ .33 (item 26)73 (item 44) $e3 - e4; e4 - e5$ .51 (item 32)78 (item 20)Just-identified model.56 (item 14)77 (item 21)

Table 1:	Error covariance.	factor loadings and	d reliability coefficient	s $\alpha$ of the CFA models.
			/	

The two items had relatively low factor loading during all analyses and thus seem to be problematic. Item 8 (*I try to let things work out on their own*) from the Proactive Coping subscale and item 39 (*I make sure my family is well taken care of to protect them from adversity in the future*) from the Preventive Coping subscale did not significantly load on the appropriate factor<sup>1</sup>. As can be seen in Table 2, a one-factor solutions fit the data reasonably well with slight differences across each scale of the PCI. The reliability coefficients  $\alpha$  ranged from .555 to .793, indicating that the reliability is acceptable. Moreover, the combined multiple-factor models were established.

<b>Fable 2:</b> GOF indexes of the CFA model
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Model	$x^2$	df	$x^2/df$	RMR	RMSE	GFI	AGFI	PCLOS
					А			E
1. Proactive Coping	146.34	69	2.12	.026	.050	.957	.934	.475
2. Preventive Coping	55.69	30	1.86	.025	.044	.976	.956	.696
3. Reflective Coping	77.73	40	1.94	.024	.046	.969	.949	.649
4. Strategic Planning	6.26	1	6.26	.016	.109	.993	.931	.074
5. Instrumental Support	41.38	17	2.43	.021	.057	.977	.952	.281
6. Emotional Support	4.288	3	1.429	.010	.031	.996	.981	.616
7. Avoidance Coping	Just-identif	ied mode	1					
7-factor model	2850.42	1399	2.037	.040	.048	.800	.780	.874
5-factor model	2908.27	1411	2.061	.041	.049	.797	.779	.786
4-factor model	2907.10	1413	2.057	.041	.049	.796	.778	.802
3-factor model	2946.92	1406	2.096	.041	.050	.788	.768	.607

The original 7-factor model fits the data well (see Table 2) with factor loadings ranging from .10 (item 8) and .11 (item 39) to .76 (item 32) and with overall  $\alpha = .875$ . The intercorrelations among the factors were examined (see Table 3). The significant and positive relationships among the most of the variables were found except significant and negative correlations for Avoidance subscale. There were the two strong relationships between Preventive Coping and Reflective Coping (.690) and between Instrumental Support and Emotional Support (.675), indicating that some of the factors may be too similar and therefore redundant. In the next step a 5-factor model was tested; it merged those variables into a simpler structure.

	Table 3: In	ntercorrela	ations of the	7-factor n	nodel.		
7-factor model	<i>n</i> of items	2.	3.	4.	5.	6.	7.

<sup>1</sup> However, to remain consistent with the original PCI subscales, these items were included in the further analyses unless stated otherwise.



1. Proactive Coping	14 items	.367**	.423**	.365**	.111*	.179**	264**
2. Preventive Coping	10 items		.690**	.539**	.184**	.061	180**
3. Reflective Coping	11 items			.452**	.221**	.121*	120*
4. Strategic Planning	4 items				.135**	.094*	259**
5. Instrumental Support	8 items					.675**	.016
6. Emotional Support	5 items						066
7. Avoidance Coping	3 items						

*Note*: \* = Correlation is significant at the 0.05 level (2-tailed). \*\* = Correlation is significant at the 0.01 level (2-tailed).

The 5-factor model represents the data well (see Table 2) with no overall GOF index differences comparing to the 7-factor model. When the content interpretation of the factors fit was assessed, the 5-factor solution was decided to better represent the data. The intercorrelations among the factors were further checked (see Table 4).

Table 4:	Intercorrelation	s of the 5-fac	ctor model.		
5-factor model	<i>n</i> of items	2.	3.	4.	5.
1. Proactive Coping	14 items	.464**	.389**	.136**	273**
2. Preventive/Reflective Coping	21 items		.558**	.170**	179**
3. Strategic Planning	4 items			.131**	253**
4. Instrumental/Emotional Support	13 items				030
5. Avoidance Coping	3 items				

*Note*: \* = Correlation is significant at the 0.05 level (2-tailed). \*\* = Correlation is significant at the 0.01 level (2-tailed).

Similarly, the model fits the data on the acceptable level (see Table 2). The strong significant and positive correlations were found between the Preventive/Reflective Coping and Strategic Planning (.558). This intercorrelation was higher than remaining values (ranging from .153 to .264) except significant and positive correlation between the Proactive Coping and Preventive/Reflective Coping (.464). However, we did not want to combine more than two factors at the time to be able to test the subsequent verification of the factor structure suitability. Those factors were not aggregated together to form a single factor at this point. Only the Preventive/Reflective and Strategic Coping factors were combined with the other factors remained unchanged. Next, a 4-factor model was tested to see whether there is remaining redundancy among the factors.

Table 5: In	tercorrelations	of the 4-factor mo	odel.	
4-factor model	<i>n</i> of items	2.	3.	4.
1. Proactive Coping	14 items	.453**	.153**	264**
2. Preventive/Reflective/Strategic Planning	25 items		.180**	203**
3. Instrumental/Emotional Support	13 items			028
4. Avoidance Coping	3 items			

*Note*: \* = Correlation is significant at the 0.05 level (2-tailed). \*\* = Correlation is significant at the 0.01 level (2-tailed).

The CFA analysis confirmed the factor structure of the 4-factor model (see Table 2). The remaining significant intercorrelations were low (see Table 5). The only exception was remaining positive correlation between the Proactive Coping and Preventive/Reflective/Strategic Coping factor (.453) suggesting that the factor model might have even simpler structure.

To statistically test this hypothesis, a 3-factor model was tested, including the Proactive / Preventive / Reflective / Strategic Planning, Instrumental / Emotional Support and Avoidance Coping. The model fit well overall (see Table 2). A significant positive correlation was found between the first factor and the Instrumental/Emotional Support (.191) and Avoidance Coping (-.281). The results did not suggest any further factor redundancy.



Although, the fit indices for all CFA combined PCI models were almost equal, the original 7-factor model fit the data best based on the factor specificity and remaining interfactor correlations.

# DISCUSSION

The present study was designed to test whether a priori stated hypothesis on the nature of the proactive coping will hold across a medium-size Czech university student sample. The stability of the factor structure was tested using a number of CFAs. Preliminary analyses were conducted consisting of the Expectation Maximization (EM) algorithm for solving missing values in the presented data set and the Mahalanobis distance values for detecting the multivariate outliers.

First, individual one-factor models for each PCI subscale as measured by the PCI (<u>Greenglass et al., 1999</u>) were tested to confirm their unidimensional factor structure. Single-factor models covering seven PCI subscales fit well with appropriate error covariance added if needed. However, item 8 from the Proactive Coping subscale and item 39 from the Preventive Coping subscale did not significantly load on their factor. Moreover, the single models were sufficiently reliable.

Further, the 7-factor structure was modeled to examine the intercorrelations among the original factor structure of the PCI. An inspection of the factor intercorrelations suggested that some closely related factors were highly redundant. There were two pairs of factors strongly related to each other: Preventive Coping and Reflective Coping, and Instrumental Support and Emotional Support. In the next step, a 5-factor model was tested combining those variables into one factor. Similarly, the model fit the data on the acceptable level. However, strong correlations were present between the newly-created factor combining Preventive/Reflective Coping and Strategic Planning subscale. On the basis of these correlations, the simpler 4-factor model was tested. Despite the reduction in the number of factors, there was still an existence of a significant and positive correlation between the Proactive Coping and the Preventive/Reflective/Strategic Planning factor suggesting that the factor model might have even simpler structure. To statistically test this hypothesis, the 3-factor model was tested, including the Proactive/Preventive/Reflective/Strategic Planning, Instrumental/Emotional Support and Avoidance Coping. If comparing 4- and 3-factor models, the 69% of unique variance between the merged factors for the 4-factor model and 79% of unique variance for the factors combined in the 3-factor model can be enough to retain merged factors to be separate factors. In other words, 31% and 21% of the shared variance between the factors of these models does not seem to be sufficient to form unified factors. Even in the 5-factor model, the shared variance of the combined factors did not exceed 50%, and thus did not indicate factor redundancy. Therefore, all combined PCI models met the minimal requirements for a good model of fit; the factor abundance in the form of shared variance was taken into account. On this basis, the original 7-factor model best represented the data, highlighting the close factor relationships indicating measuring coherent constructs.

The presented unstable factor structure of the coping construct is further visible. For example, a fourteen-factor model emerged out of the EFA on a sample of senior citizens of India (<u>Bhusban, Gautam, & Greenglass, 2010</u>). On the other hand, the seven-factor model representing the original factor structure of the PCI was verified using CFA on a Hungarian college and university student sample (<u>Almássy, Pék, Papp, & Greenglass, 2014</u>). Also, the 3-factor model was previously developed by <u>Šolcová et al. (2006</u>) with the Czech version of the PCI tested on a medium-size student sample; however, the authors favored the original 7-factor structure. Similarly, <u>Roesch, Aldridge, Huff, Langner, Villodas, and Bradshaw (2009</u>) tested multi-factor models of the original version of the PCI on large multiethnic sample. The 3-factor structure was analyzed with the factors renamed to Logical Analysis and Problem Solving, Social Support and Avoidance. Moreover, more complex conceptualizations of coping were suggested by <u>Cook and Heppner (1997</u>), who examined the psychometric properties of the Coping Inventory for Stressful Situations, the COPE and the Coping Strategies Inventory. Likewise, three general factors were found across the three measurements: Problem Engagement, Avoidance and Social/Emotional.

There are several limitations of the presented study. The first limit is associated with a general criticism of statements using self-reports. It always brings a declared statement about the level of proactive coping and not its actual usage. Second, the concept of proactive coping is forward-looking bringing the findings about future



coping behavior. Last, these results are generalizable only to this presented research sample of university students and therefore generalization to other samples would be inappropriate.

Future research capturing dimensionality of proactive coping with large-size heterogeneous sample would be beneficial. So far, the average range of the most researched sample is approximately 200-300 respondents with a mean age of approximately 20 years, corresponding to college and university students. Ideally, the minimal number for reliable results is greater than 100 and five times the number of items.

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# Fear of Missing Out at Adolecences and Academic Burn Out and School Drop Outs in Turkey

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# 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 continiosly 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 adelocences 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 adolecences to uneasy feelings of missing out and also be a reason for the early school leaving. In this research we saught to find out what are the specialities of adoleceences who are under the risk of FOMO and having school burn out and academic failiture. For this reason we conducted a qualitative research and interviewed 20 adolecences between the ages of 14-19 that tend to leave school or experiencing academic failitures and burn out and declaring that they have excessive internet useage habit. The research indicated that the adolecences 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 adololences.

# **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 (Valkenvburg, &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, instigram. The reseaches on social media displays two different wiev. One shows us that social media as a nortworthy resource of positive effects on well being (e.g., boosting selfworth, 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 phenomen "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 qualitivie point of view examines the properities of the students with FOMO who have under the risk of academic burn out and failiture.



# 1. 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 prefered by adolecences 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 adolecences 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.

# 1.2 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 comunication with family and friends (Barker, 2009; Kim, LaRose & Peng, 2009), lower selfesteem (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 (Błachnio 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 Communication" for the ones suffering from socialfobia or alleniation 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).



#### 1.2. 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, Indviduals 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 prefered 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 hypotesis 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 phenomen and related concerns led us to question what are the properities of the adolecences who were under the risk of school drop out because of excessive social media use. Also did these adolecences experience Fear of Missing Out?

## METHODS

#### **Research Model**

This study aims to explicate perceptions of the adolocences about FOMO concepts deeply. Therefore, the phenomenology approach of qualitative desriptive 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 vey 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 failitures in Turkey. Of 13 students were female and 7 of.20. The avarage age of paticipants 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 Providence, 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 adolecences, 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 counceling service rooms of the schools in Istanbul, Turkey and each interview took aproximately 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.

#### **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.



Theme	Codes	Participants	f
dia	use of social media as soon	G1,G4,G6,G7,G8	13
Me	as waking up.	G9,G10,G11,G12,	
al		G14,G16,G19,G20	
Jse Jse			
	use social media when	G1,G2,G3,G5,G7,G8,	11
	having breakfast	G10,G13,G16,	
		G18,G19	
	Use of social modia while	G2 G4 G5 G6 G8 G10	12
	baying lunch	$C_{12}C_{12}C_{14}C_{16}C_{16}$	12
	naving lunch.	G12,G13,G14,G10,	
		018, 019,020	
	· · · · · · · · · · · · · · · · · · ·		10
	Use social media while	G1,G3,G5,G7,G10,	10
	having dinner	G16,G17,G18,G19	
	Use social media just	G1,G2,G4,G5,G7,G9	12
	before going to bed	G11,G13,G14,G16,	
		G17,G19	

# Table 1. Excessive Social Media Use

The vast majorty 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 messanger. (G16)

Theme	Codes	Participants	f
teasons for teassive Aedia Use	To build a new social identy	G2,G5,G6,G7,G9 ,G10,G11,G12, G13,G16,G18,G19	12
₩ H X	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

Table 2 The Reasons of Excessive Social Media Use

The research indicates that most of the adolecences 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 adolecences 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)

 $\dots$ I sometimes think about what is the best picture of mine before posting as my friends see and comment on it.(G3)

Peer acceptence and interpersonal feedback is a really important issue for adolecences. According to this research especially half of the adolecences 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 instagram I have many followers that like my pictures (G20).

Most of the adolecences also perefered to use social media as a communication tool. They stated that they used texting on facebook or instagram 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 ,texing is easier and funnier for me.(G12)

Theme	Codes		Participants	f
and	Feeling isolated	or	G2,G5,G6,G7,G9,	12
nt e ji	alienation a	and	G10,G11,G12,	
AO den D O	Experiencing FOMO		G13,G16,G18,G19	
FON Aca Fail: Buri				
	Feeling Anxiety a	and	G2,G3,G4,G6,G8,G10,	10
	depression because	of	G11,G13,G16,	
	missing a life event wh	nen	G20	
	school time, or studyi	ing		
	for a subject			
	Kaaping Track of at	hor	G1 G4 G5 G7 G0	7
	neeping Track of Ou	dia	$G_{1,04,03,07,09,00,00,00,00,00,00,00,00,00,00,00,00,$	7
	during school time	ula	011,017	
	during school unie			
	Feeling Burn out or po	oor	G3,G4,G8	3
	grades and drop of	outs		
	because of experienci	ıng		
	FOMO			

Table 3. FOMO and Academic Failiture, and Burn out and Drop ou
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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 adolecences experiencing academic failitures 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 failitures, burn outs and intention to drop out schooling. Specifically, the findings of this study indicates that adolecences 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 failitures of the students experiencing FOMO. According to the findings, the adolecences experiencing FOMO tend to feel isolated and alienated more and they feel anxiety or depression becuase 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 adolecences experiencing FOMO and academic failiture and burn outs supports the provious researches. Past Researches, to our knowledge, has not presented a qualitative point of view related to FOMO and academic failiture, 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 adolecences experiencing FOMO and academic failitures 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 wellbeing (Turkle, 2011) and learning skills.



Finally, related to these changes in technology and these research findings, parents, academic counselors and educational practitioners working with adolecences 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.

## CONCULUSION

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 failture and burn outs and drop outs at young generation. Additionally, it establishes the properites 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.

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# **Flipped Classroom in Pathology Education**

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## ABSTRACT

This paper reports the results of implementation of an innovative teaching method into undergraduate Pathology education. Pathology as a subject was always taught via didactic lecture approach; and despite positive student feedback, results of higher order assessments were consistently below average. Our method combined flipped classroom, concept mapping, and immediate feedback. An assigned reading, you-tube video, a quiz, and a concept map outline were provided as pre-class activities. During the class, utilizing the *GoFormative* software, students answered the same quiz in groups, providing responses via laptops or tablets. The instructor operated one iPad to project the quiz in class and zoom images as required while another iPad was used for viewing live student responses and providing immediate feedback. Post-lecture formative assessment included another quiz based on higher order cognitive skills and a crossword puzzle prepared using *Puzzlemaker* at *Discovery Education*. Although our study revealed mixed student feedback, adopting our pedagogical approach fostered deeper learning and demonstrated significantly improved student academic learning outcomes.

Flipped classroom, concept mapping, immediate feedback, medical education

# **INTRODUCTION:**

With technological advances, there is an increasing demand on academics in all disciplines to adapt their teaching styles to better suit new millennial learners (McLaughlin 2014, p236, Findlay-Thompson 2014, p63). The pathology topic of "Introduction to Neoplasia' taught to first year medical students at RUSM had always been taught using a traditional didactic approach, with a primary focus on description of terminology related to neoplasms. Despite positive student feedback, results of higher order assessments were consistently below average. So, it was hypothesized that if students previewed terms related to neoplasms as well as undertook formative assessments prior to class, face-to-face classes could be more effectively used for active learning of application-based exercises in small groups and these students would also perform better in summative assessments. We tailored the topic that used a flipped classroom pedagogy (McBride 2015) to offer students a relevant and engaging learning experience in Pathology education along with concept mapping (Pock 2016, p47) and immediate feedback.

#### THE STUDY:

In September 2016, a new lecture was designed at the Pathology Department in RUSM using the flipped pedagogical approach and was further improvised in January 2017. The method utilized two mobile devices (iPads). The instructor operated one iPad to project the quiz in class and zoom images as required while another iPad was used for viewing live student responses and providing immediate feedback utilizing the *Goformative* software. Preand post-class activities were developed with checkpoints for students to encourage and test retention of information. Pre-class activities involved students reading a set of power point slides and/or textbook pages, watching a 1-minute *you tube* video, reading a 1-page journal article as well as completing a pre-lecture quiz based on the information relayed in the online material. Pre-lecture quiz or the readiness assurance test (RAT), which included multiple choice questions, open-ended questions as well as an exercise of creating directed concept maps, was first taken and submitted on an individual basis. During the large classroom session, the same pre-lecture quiz was then taken again as teams when students responded via laptops or tablets using the *GoFormative* software and an immediate feedback was provided on team performances. For post-lecture formative assessments, a post lecture quiz based on higher order cognitive skills (Lemons 2013, p) and a crossword puzzle (Saxena 2009, p1457) prepared using *Puzzlemaker* at *Discovery education*) was provided.



To evaluate the effectiveness of our approach, we evaluated student feedback as well as surveyed the pathology scores in internal summative examinations of students who took the individual pre-lecture quiz and compared them with those students who had not taken the pre-lecture quiz during the flipped classroom sessions.

#### FINDINGS:

Students were actively engaged in various team-based activities.

#### Figure 1: Sample of pre-lecture quiz using Go-formative

- A 55-year-old man is diagnosed with metastatic lung cancer. The term metastasis refers to which of the following?
  - Dark blue staining of nucle
  - Secondary neoplasm at a new site
     Variation in size and shape of cells
  - A malignant tumor
     A pre-malignant tumor
- A 42-year-old woman undergoes surgical excision of a breast mass measuring 4 cm in size with infiltrating borders. A chest x-ray showed two nodules in the left lung, not present a year ago. Histological sections from both the breast mass as well as the lung nodule show cytological features of malignancy. Which of the following features is the most compelling evidence that the lesion is malignant?
  - Size of breast mass > 2 cm Presence of capsule in breast mass

  - Occasional mitotic figures in breast mass
     Nodules on chest x-ray with cytological atypia
     Absence of cytological atypia

#### Figure 2: Sample of responses received using Go-formative



## **Concept Mapping**

Students created directed concept maps based on instructor provided basic outline (Figure 3) as well as exercises integrating pathology with other disciplines (histology and embryology).

Figure 3: Instructor directed Concept Maps with basic outline provided to students (prepared using Mindomo software)





#### Internal Summative assessment

Pathology scores in internal summative examinations of students who took the individual pre-lecture quiz (or RAT) when compared with those students who had not taken RAT prior to the flipped classroom sessions were 5.9% and 19% higher in September 2016 and January 2017 respectively for those students who took RAT prior the classroom session.

Students who took RAT prior to flipped classroom session	Average Pathology score (September 2016)	Average Pathology score (January 2017)
No	72.3%	61.9%
Yes	78.2%	80.9%
Academic Improvement	5.9%	19%

## Student Feedback:

Student feedback was mixed and ranged from "My first time going to class in weeks. I really enjoyed class today" and "It was greattt!!!" to "It was okay, but could have been better....".

#### **CONCLUSION:**

Preliminary experiences of flipping a pathology lecture for our first year undergraduate cohort at RUSM active learning pedagogy coupled with advanced instructional technology are presented. By eliminating the didactic delivery of content via traditional lectures enabled us to better utilize the face-to-face time for higher level thinking in team-based small group activities and allowed us to extend, apply and consolidate student understanding of the



online material in class. Student views on the flipped classroom were mixed, but they were actively engaged during the session and internal summative assessments demonstrated an increase in their performance when students took pre-lecture quiz prior to the flipped classroom session. Eliminating didactic delivery of content not only enabled better utilization of time for higher level thinking allowing knowledge application in small groups but also resulted in better student performance when students came prepared.

Thus, although our study revealed mixed student feedback, adopting our pedagogical approach fostered deeper learning and demonstrated significantly improved student academic learning outcomes.

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# Fostering Pre-Service Teachers' Socio-Scientific Argumentation Skills with Vake (Values and Knowledge Education)

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# ABSTRACT

The aim of this quasi-experimental study is to examine the potential of the constructivist teaching and learning approach VaKE (Values and Knowledge Education) to foster pre-service teachers' socio-scientific argumentation skills. VaKE combines values education through dilemma discussion and knowledge acquisition through inquiry-based learning. The written arguments of pre-service teachers (N = 85) before and after the intervention were content analyzed. The results indicate that VaKE contributes to foster the content-oriented quality of arguments. Compared to a traditional knowledge-centered case-discussion pre-service teachers apply more often the acquired knowledge and use more moral considerations in their arguments.

# **INTRODUCTION**

Developing student's social responsibilities through fostering skills of argumentation, critical thinking and decision-making is recognized as necessary in curricula worldwide. Moreover, in the construction of scientific knowledge the significance of argumentation is considered as the core of learning (Duschl, 1990; Ohlsson, 1992). Thus, science teachers play an important role in nurturing their students' argumentation skills (Driver, Newton & Osborne, 2000; Duschl & Osborne, 2002; Osborne, Erduran & Simon, 2004; Roberts & Gott 2010; Sadler, 2004a; Cetin, Dogan & Kutluca, 2014). A possible way to address student's argumentation skills is through discussing socio-scientific issues (McDonald, 2010; Osborne, Erduran & Simon, 2004; Sadler & Donnelly, 2006). Socio-scientific issues (SSI) are social dilemmas that have conceptual or technological links to science and involve ethical and moral implications, as for example global warming, nuclear energy, cloning, genetic diseases or genetic engineering (Sadler, 2004a). According to Sadler (2004a) socio-scientific argumentation requires the aptitudes of scientific knowledge acquisition (e.g., inquiry-based learning), understanding of the nature of science (e.g., reflection on the social embeddedness of scientific progress), and awareness of moral and ethical issues (e.g., moral reasoning). Fostering these aptitudes call for didactical approaches which are based on active learning, co-construction, and discussion (Erduran, Simon & Osborne, 2004; Osborne, Erduran & Simon, 2004; Sadler, 2004a). And it implies shifting away from the role of the teacher as an authoritative figure providing right answers and moving towards the role of a teacher as facilitator of learning (Zohar, 2008) which for example is a characteristic feature of constructivist teaching methods (Loyens & Rikers, 2011).

However, although socio-scientific argumentation is considered important in science education it is rarely addressed in schools and in teacher education due to (i) the overloaded curricula which focus on factual knowledge leaving no time for dialogue and argumentative discourse (Hurd, 2002; Osborne, 2010; Osborne, Erduran & Simon, 2004), (ii) the priority of knowledge transmission modes of teaching and learning in many educational systems that emphasize recall over higher-order thinking minimizing opportunities for discussion and inquiry-based learning (Kim & Roth, 2008; Osborne, 2007; Osborne, 2010; Wells, 1999), and (iii) the teachers' lack of adequate teaching approaches to address socio-scientific argumentation appropriately (Archila, 2014; Simon, Erduran & Osborne, 2006) which consequently leads to problems when they want to implement argumentation (McNeill, Lizotte & Krajcik, 2006). Moreover, teachers often themselves rely on their personal theories in scientific argumentation and do not include evidence as support for their argument (Sampson & Blanchard, 2012).



Thus, there is a need to address the development of argumentation skills in pre-service science teacher education (Zohar, 2008). The study addresses this need by investigating the potential of the constructivist approach VaKE (Values *and* Knowledge Education; Patry, Weinberger, Weyringer & Nussbaumer, 2013) to foster socio-scientific argumentation skills in pre-service teachers. VaKE combines moral education through the discussion of content-related moral dilemmas and knowledge construction through inquiry-based learning.

The research question is whether V*a*KE can foster the quality of socio-scientific argumentation skills in preservice teachers. In order to assess pre-service teacher's arguments Toulmin's argument pattern (TAP; Toulmin, 1958/2003) was applied which has proven to be a valuable analysis tool for argumentation (Erduran, Simon & Osborne, 2004).

# ARGUMENTATION

According to Toulmin (1958/2003) an argument is defined as an assertion or conclusion and its accompanying justification. Argumentation is considered a central part of informal reasoning which is reasoning that takes place in everyday life when we reason about causes and consequences, about pros and cons, and about particular propositions or decision alternatives. Informal reasoning involves ill-structured problems that have no definite solution, such as moral dilemmas or SSI (Zohar & Nemet, 2002). Formal reasoning relates to the idealized logical-formal arguments used in philosophy.

Toulmin (1958/2003) developed an argument pattern (TAP) for informal reasoning consisting of five main elements which characterize the structure of an argument: claim, data, warrant, backing, and rebuttal (see fig. 1).



Figure 1. Toulmin's argument pattern (Toulmin, 1958/2003)

In applying TAP to assess the quality of arguments the first three criteria are generally considered to compose a simple initial argument (Erduran, Simon & Osborne, 2004; Zohar & Nemet, 2002). According to Toulmin (1958/2003, p. 89–100) a "claim" is an assertion put forward publicly for general acceptance. "Data" are explicitly stated specific facts relied on to support a given claim. "Warrants" are generalized, hypothetical and often implicit statements which act as bridges and legitimize the step from the data to the claim as an appropriate one. The "backing" lends authority to the warrant and can be expressed in the form of categorical statements of facts or moral principles. It is often stated implicitly. "Rebuttal" refers to a statement indicating circumstances in which the general authority of the warrant would have to be set aside. Consider the following example from this research about the SSI reproductive cloning which represents the different elements of the TAP:

The parents should decide to clone their ill son who suffers from leukemia because he needs organ transplantations to survive. The clone will be the ideal organ donor for the ill son. Life has to be preserved in any case. But the parents should not decide to clone their son if the clone will suffer pain from being an organ donor.

The claim of this argument is "The parents should decide to clone their ill son ..." which is supported by the datum "... who suffers from leukemia and needs organ transplantations". The warrant "The clone will be the ideal organ donor for the ill son" legitimizes the step from the data to the claim. This warrant is supported by the backing "Life has to be preserved!" which states a general moral principle. Finally, the argument is completed with the rebuttal "But the parents should not decide for reproductive cloning if the clone will suffer pain from being an organ donor".

Argumentation in socio scientific contexts presents learners with the challenge of justifying a moral claim (e.g.; "The parents should decide to clone their ill son!"). Moral claims refer to prohibitions (e.g., "should not", "it is forbidden") or imperatives (e.g., "should"). In contrast, factual propositions refer to pieces of evidence. Such propositions typically exemplify scientific knowledge (e.g.; the datum "Their son suffers from leukemia and needs organ transplantations to survive" and the warrant "The clone will be the ideal organ donor for the ill son"). In socio-scientific arguments moral as well as factual propositions appear (Sadler, 2004b; Zeidler & Sadler, 2007; Zohar & Nemet, 2002). They are related with each other. A sound justification of a moral claim only has a valid form if it includes moral propositions (MacKinnon & Fiala, 2016; Gratzl, 2006). This criterion is based on Hume's law or the is-ought problem. According to Hume (1738) it is a logical fallacy to derive a moral claim solely from factual propositions. Moral propositions included in a justification typically appear as moral principles which are (often implicitly) stated as backing of the warrant (e.g., "Life has to be preserved!"). The moral principles are based on some normative moral theory which expose a particular view about what is the nature and basis of good and right. Key moral theories include virtue ethics, deontological ethics and teleological ethics (MacKinnon & Fiala, 2016; p. 12). According to virtue ethics actions are judged in terms of their motive (e.g.; Reproductive cloning is good because the parents intend to save their son's life - or it is bad because the parents are egoistic.). According to deontological ethics actions are judged in terms of the character or nature of the act itself (e.g.; Reproductive cloning is good because life should be preserved – or it is bad because humans should not be treated as means to an end.). Finally, according to teleological ethics actions are judged in terms of the consequences of the actions (e.g.; Reproductive cloning is good because life-threatening diseases can be cured – or it is bad because the clone will suffer pain from being a donor.).

TAP and its modified versions have enabled researchers to use it to examine the quality of socio scientific arguments in a variety of domains including science in school (e.g., Erduran, Simon & Osborne, 2004) and in pre-service teacher education (e.g., Karisan & Topcu, 2016). Two main quality criteria for socio-scientific arguments can be distinguished (Chang & Chiu 2008; Chang, Rundgren & Rundgren, 2010; Grace 2009; Osborne, Erduran, & Simon 2004; Sadler & Donnelly 2006; Sadler & Fowler, 2006; Sampson & Clark, 2008; Tal & Kedmi, 2006; Wu & Tsai 2007; Zohar & Nemet 2002). The first quality criterion refers to *structurally oriented aspects*. Based on the TAP it includes (i) the number of valid justifications (data, warrant and backings as one category) provided together with the claim, (ii) the branching of the justifications, (iii) the number of valid counter arguments (alternatives to one's own standpoint), and (iv) the number of valid rebuttals. The second quality criterion refers to *content oriented aspects*. It includes (i) the quantity and quality of content knowledge supporting the argument, and (ii) the reference to moral values or moral principles. A few studies in the context of pre-service teacher education indicate that teaching approaches which include argumentation-based tasks for learners can enhance argumentation skills (e.g., Acer, Patton, & White, 2015; Sadler, 2006; Sà Ibraim & Justi, 2016; Zembal-Saul, 2009; Zembal-Saul, Munford, Crawford, Friedrichsen, & Land, 2002). It is assumed that VaKE represents such an approach.

# VAKE (VALUES AND KNOWLEDGE EDUCATION)

V*a*KE is a constructivist teaching approach which integrates development of moral reasoning through dilemma discussion (Lind, 2016) and knowledge acquisition through inquiry-based learning (Reitinger, Brewster, Haberfellner & Kramer, 2016). The integration of moral reasoning and knowledge acquisition provides the possibility to address the moral goals without neglecting the knowledge goals.



The learning process is initiated by a content-related moral dilemma, which involves moral implications and is linked to particular knowledge (Patry et al., 2013). The dilemma triggers a moral question ("What should be done and why?") and a question related to knowledge ("What do I need to know to come to a satisfying solution?"). Since SSI address moral questions of right and wrong and questions regarding to scientific knowledge (Zeidler & Sadler, 2007; Zohar & Nemeth, 2002) it is assumed that they can be used as trigger for the learning process in VaKE.

Through the discussion of the dilemma and inquiry-based learning the learners try to make an informed judgment. The dilemma discussion is a well-established method to promote moral reasoning in different educational settings including teacher education (Cummings, Maddux, Cladianos, & Richmond, 2010). It is designed to discuss the moral considerations of an issue. Unlike other studies who explicitly aim at fostering learners' moral development (e.g., Cummings et al., 2010) the dilemma discussion in this study is primarily used to foster the consideration of moral principles in order to formulate valid socio-scientific arguments. Inquiry-based learning is the core method of scientific knowledge construction (Loyens & Rikers, 2011). In contrast to traditional ways of learning inquiry-based learning methods emphasize active student participation and co-construction through cooperative learning. Instead of providing the learners with a question and the answer, they formulate their own questions and explore possible answers based on appropriate ways of facilitation such as challenging questions. Evidence suggests that inquiry-based learning methods foster meaningful learning in teacher education resulting in the application of the acquired knowledge (Wagner, Stark, Daudbasic, Klein, Krause & Herzmann, 2013).

VaKE-education follows a learning sequence consisting of eleven steps (see table 1): A VaKE-unit starts with introducing the content-related moral dilemma and analyzing the moral values which are at stake. The learners become aware that each decision is based on different moral values (step 1). Subsequently they reflect upon their decision and take a position by writing down their own argument (step 2). In small groups they discuss the arguments (step 3). The dilemma discussion is designed to (i) challenge thinking (e.g.; "What is your argument?"); (ii) reexamine assumptions (e.g.; "Do you have any data for your claim?"); (iii) take others' point of view (e.g.; "What would person X think about this problem?"; (iv) set up logical arguments (e.g.; "What are the premises of your claim?"); (v) respond rationally to counterarguments (e.g.; "What is your argument as a response to person X's point of view?"); and (vi) consider moral principles (e.g.; "Which consequences will likely occur when deciding for this option?"; "Is your decision generalizable?"; "Does your decision break a universal moral rule?"). The dilemma discussion is based on discussion rules (e.g.; "Each argument is permissible!"; "Do not interrupt when someone else is speaking!"; "Make use of what others have to say when it is your turn to speak!"). Personal attacks are forbidden and all arguments must be formulated in a reversible way, i.e. the speaker would accept to be addressed the same way. Then the results of the discussion are exchanged in class highlighting the most convincing arguments and missing knowledge is collected. The learners formulate their own questions and learning goals (step 4). In small groups they search for the missing knowledge using different sources of information (step 5). They exchange their acquired knowledge and discuss it so that all learners have the same level of knowledge (step 6). After that the dilemma discussion in small groups is continued. The learners apply the acquired knowledge by integrating it into their argument (step 7). In a general discussion, the results of the dilemma discussion are presented and all learners discuss their favored arguments. Challenging questions provided by the teacher (see step 3) stimulate reflection and reasoning (step 8). If there are still open questions, the steps 4 to 8 can be repeated once again (step 9). In the final synthesis, the learners present the solved problem of the whole group. This can be done in didactically sophisticated ways such as through role plays, writing a newspaper, etc. (step 10). Finally, in the generalization the learners deal with similar issues they consider important to broaden the perspective (step 11).



(1) Introducing the dilemma: Which values are at stake?

(2) *First decision:* Who is in favor, who against?

(3) First arguments (dilemma discussion): Why are you in favor, why against? Do we agree with each other?

(4) Exchange experience and missing information: Exchange of arguments; what more do I need to know to be able to argue further?

(5) Looking for evidence: Get the information, using any source available!

(6) Exchange of information: Present the information! Is the information sufficient?

(7) Second arguments (dilemma discussion): Why are you in favor, why against?

(8) Synthesis of information: Present your conclusions!

(9) Repeat 4 through 8 if necessary

(10) General synthesis: Closing the sequence capitalizing on the whole process!

(11) Generalization: Discussion about other related topics

**Table 1.** Standard steps in VaKE (adapted from Patry et al., 2013, p. 567)

VaKE-education shares many commonalities with SSI-based education. According to the framework of Sadler (2011; Sadler & Murakami, 2014) SSI-based education includes several essential elements which are represented in the steps of VaKE. Essential *design elements* are: (i) Framing instruction around a compelling social issue related to science and featuring this issue at the outset of instruction (represented in VaKE-step 1); (ii) presenting the issue first (represented in VaKE-step 1); (iii) providing scaffolding and appropriate facilitation for higher-order practices, such as for argumentation, reasoning and decision-making (represented in VaKE-steps 3, 4, 7 and 8) and (iv) providing a culminating experience (represented in VaKE step 10). Essential *learning experiences* of SSI-based education are: (i) Engaging students in reasoning, argumentation, decision making, or position taking (represented in the VaKE-steps 2, 3, 4, 7, and 8); (ii) confronting the scientific ideas and theories related to the issue (represented in VaKE-step 6); (iii) collecting and/or analyzing scientific data related to the issue (VaKE-step 5); and (iv) negotiate the social dimensions of the issue (VaKE-steps 3, 4, 7, and 8). According to Sadler (2011) an explicit focus on the moral considerations associated with the issue may not be absolutely necessary.

It is expected that pre-service teachers when discussing SSI according to V*a*KE will foster the structurally and content-related quality of their arguments because the different steps of V*a*KE (Patry et al., 2013) challenge them to continually elaborate their data, warrants, backings and rebuttals (Toulmin, 1958) and to integrate factual and moral propositions in order to come up with a valid socio-scientific or moral argument (MacKinnon & Fiala, 2016). Particularly, it is hypothesized that this learning process increases the number of valid justifications, branching of the argument, rebuttals and counter arguments (hypothesis 1) and the number of applied facts (knowledge) and moral principles to ground the claim (hypothesis 2).

# METHODS

85 pre-service teachers (four classes; 21 males) taught by four teachers of a teacher education institution in Austria participated in the study. The study was embedded in the course "Values education in the context of social learning" (1 ECTS workload) which pre-service teachers attend in their  $2^{nd}$  year of their education. This course focusses on general methods and views of education and learning including moral education, moral development and moral argumentation. Part of this course was conceptualized according to V*a*KE. Most of the participants (81%) were preparing for teaching science. The participants gave informed consent to take part in the study.

A quasi-experimental research design with pretest (T1) and posttest (T2) was applied. The experimental group (EG; two classes;  $N_{EG} = 44$ ; 11 males) was taught according to V*a*KE and the control group (CG; two classes;  $N_{CG} = 41$ ; 10 males) was taught according to a traditional case-analysis (Merseth, 1996) which includes (i) studying the case individually, reviewing important data and answering study questions provided with the case by the teacher educator, (ii) studying the case in small groups, sharing insights and opinions, and (iii) discussing the case in the larger seminar group under the guidance of the teacher educator. The content-related dilemma in both groups was a SSI-case referring to genetic engineering and is as follows:



#### Future decision

We live in the year 2030. In a faraway country, there lives a 14-year-old boy. During a routine health examination, the school doctor finds indication of a dangerous disease at this boy. The doctor makes the diagnosis leukemia. For medical treatment, the boy needs blood transfusions, bone marrow transplants and tissue transplantations. Because there are no closely related compatible donors the doctor explains the parents that the only medically sensible alternative is the method of reproductive cloning. The cloned brother of the ill boy would be a genetical copy of their son and the ideal donor for him. The parents always wanted to have another child. They looked at each other. Their son's life is at stake. What should they do and why?

In the CG the focus was on knowledge acquisition; dilemma discussions were not included. Nevertheless, in the CG moral considerations were addressed because SSI include issues of right and wrong. But compared to the EG the discussion of moral considerations in the CG occurred in an unsystematic way. The intervention in both groups lasted four units. All participants conducted the knowledge acquisition partly at home. In the EG the VaKE-steps 9 to 11 were omitted due to time restrictions.

The instrument was an open-ended question asking the participants to formulate their argument to the dilemma ("What should the parents do and why?"). At T2 this question was accompanied by a prompt to use the acquired knowledge to ground the claim. The participants of the EG responded to the open-ended question in VaKE-step 3 (T1) and VaKE-step 7 (T2). The participants of the CG responded after reading the SSI-case and at the end of the intervention. In both groups no time restrictions were given for formulating the argument.

Pre-service teachers' written arguments were content-analyzed based on the elements of the TAP and according to two main criteria (structure and content) of the quality of an argument (e.g., Zohar & Nemeth, 2002). The main criterion structure was analyzed according to four sub criteria. The first sub criterion referred to the number of valid arguments according to Toulmin (1958/2003). Each argument was analyzed whether it included a claim with at least one relevant justification (datum, warrant, and/or backing). Responses that included a conclusion with no justifications (e.g., "I think the family should not clone the ill son.") or conclusions with pseudo-justifications (e.g., "I think the family should not clone the ill son because cloning is bad.") were not accepted as valid arguments (scoring range: 0 = no justification, 1 = one valid justification, 2 = two or more valid justifications). The second sub criterion referred to the branching of the justifications (scoring range: 0 = no valid argument, 1 = a simple structure of a claim supported by at least one justification, 2 = a composite structure, in which the justification is supported by another reason, usually explaining why the first reason should be accepted, as for example "The family should not clone the ill son because the clone will suffer pain from donating organs and bone marrow".) The third sub criterion referred to the number of rebuttals (0 = no rebuttal, 1 = one rebuttal, 2 = two or more rebuttals). Finally, the fourth sub criterion was related to the number of valid counter arguments (0 = no valid counter argument, 1 = one valid counter argument, 2 = two or more valid counter arguments).

The second main criterion *content* was analyzed according to two sub criteria. The first sub criterion referred to the number of facts provided to ground the claim. It was distinguished between facts based on civic knowledge, such as legal knowledge or political knowledge (0 = no fact based on civic knowledge, 1 = one fact based on civic knowledge, 2 = two or more facts based on civic knowledge) and facts based on scientific knowledge (0 = no science fact, 1 = one science fact, 2 = two or more science facts). The second sub criterion referred to the moral principles provided to ground the claim. It was distinguished between moral principles based on virtue ethics, deontological ethics, and teleological ethics, each of which was scored according to a range of 0 to 2 (0 = no moral principle, 1 = one moral principle, 2 = two or more moral principles). The first rating of all written arguments was done by the author of this article. In order to assess interrater-reliability a trained research assistant rated 50% randomly selected responses independently. Interrater-reliability (Krippendorff's alpha) was satisfying (structure: KALPHA = 0.82, content - knowledge: KALPHA = 0.89, and content - moral principles: KALPHA = 0.75). All disagreements were discussed in order to attain a consensus score which was used for all further analyses. Differences between T1 and T2 in the number of mentioned criteria were examined using a Wilcoxon signed rank test with Bonferroni-corrected alpha-level.

# FINDINGS

Table 2 shows the mean scores and results of the Wilcoxon test for the structural quality criteria of arguments. It is noticeable that in both groups almost all participants justify a claim at T1 (EG: 97.7%; CG: 100%) indicating that the pre-service teachers are adept in the construction of arguments. The groups do not differ significantly at T1 (Mann-Whitney U-test: 0.10 ; four items), thus it can be assumed that they are comparable. The results of the Wilcoxon-test reveal that the branching of the arguments significantly increases in both groups, showing medium effect-sizes (*r*). No significant change between T1 and T2 was found for the number of justifications, rebuttals and counter arguments in both groups.

	EG						CG					
	T1		T2				T1		T2			
	(N = -	44)	(N = 4	44)			(N = -	41)	(N = 1	34)		
Criteria	М	SD	М	SD	Ζ	r	М	SD	М	SD	Ζ	r
Justification	1.70	0.51	1.86	0.41	-1.51	0.23	1.73	0.44	1.73	0.51	-0.26	0.04
Branching	0.13	0.41	0.52	0.69	-2.71*	0.41	0.34	0.66	0.76	0.61	-2.79*	0.44
Rebuttal	0.11	0.38	0.43	0.58	-2.52	0.38	0.12	0.33	0.09	0.29	0.00	0.00
Counter	0.29	0.59	0.43	0.58	-0.99	0.05	0.32	0.57	0.27	0.52	-0.47	0.07
Argument												

\*pone-sided < 0.006 (Bonferroni-correction); M mean; SD standard deviation; Z Z-value; r effect size

**Table 2.** Comparison between experimental group (EG) and control group (CG) regarding structural quality criteria of arguments before (T1) and after instruction (T2)

The results do not support hypothesis 1. Both interventions foster the structural quality of pre-service teachers' arguments with respect to the branching of the arguments. The intervention did not affect the number of justifications, rebuttals and counter arguments.

Table 3 shows the mean scores and results of the Wilcoxon test for the content-oriented quality criteria (*knowledge* and *moral principles*) of arguments. The groups differ at T1 with regard to the criterion civic knowledge (U = 660.0; p < 0.001) with an advantage of the control group. No further significant differences at T1 were found for the other criteria (Mann Whitney U-test: 0.72 > p > 0.09; four items). The results of the Wilcoxon-test indicate significant differences for the criteria scientific knowledge and teleological ethics. These criteria increase in the EG. The results support partly hypothesis 2: VaKE fosters the application of acquired knowledge compared to the traditional approach and it increases the use of teleological moral principles compared to the traditional knowledge centered case-analysis.

	EG						CG					
-	T1		T2				T1		T2			
	(N = 4	44)	(N = 4	44)			(N = -	41)	(N =	34)		
Criteria	М	SD	М	SD	Ζ	r	М	SD	М	SD	Ζ	r
Knowledge												
Civic Knowledge	0.00	0.00	0.14	0.41	-2.12	0.32	0.37	0.66	0.82	0.79	-2.63	0.41
Scient. Knowledge	0.23	0.48	1.16	0.83	-4.52*	0.68	0.49	0.76	0.85	0.82	-2,38	0.37
Moral Principles												
Virtue Ethics	0.18	0.39	0.34	0.57	-1.61	0.24	0.09	0.30	0.06	0.24	-0.82	0.13
Teleological	0.41	0.58	1.04	0.77	-3.85*	0.58	0.78	0.69	0.47	0.61	-2,08	0.32
Ethics												
Deontol. Ethics	1.05	0.68	1.02	0.69	-0.96	0.14	0.88	0.64	0.67	0.68	-1.39	0.22
*n < 0.006 (P	onforr	ni oom	oction)	· 11 ma	on. SD	tondard d	laviatio	n				

\* $p_{\text{one-sided}} < 0.006$  (Bonferroni-correction); *M* mean; *SD* standard deviation

**Table 3.** Comparison between experimental group (EG) and control group (CG) regarding content-oriented quality criteria of arguments before (T1) and after instruction (T2)



#### DISCUSSION

The results of this study suggest that VaKE provides a possible didactical approach to foster socio-scientific argumentation skills: The continuous elaboration on the individual argument focusing on the integration of facts and moral considerations in order to come up with a satisfying claim can increase the content-oriented quality of the argument. It could also be shown that the integration of values education and knowledge acquisition is not to the detriment of knowledge acquisition. Pre-service teachers who learn according to VaKE do not acquire less knowledge than when learning according to a knowledge-centered approach (see also Weinberger, 2006) rather the opposite is the case with respect to the application of knowledge and do not rely on their personal theories (Sampson & Blanchard, 2012) to support their claims. Additionally, through the moral dilemma discussion the moral considerations of a SSI are emphasized which increases the use of moral principles, particularly based on teleological theory, to back the warrant. Considering moral principles in the justification of a claim is important to construct valid moral or socio-scientific arguments (Hume, 1738).

Although the results argue for VaKE several limitations which are based primarily on the research design have to be considered. First, the sample size is small which diminishes the representativeness of the results. Second, only one instrument was used to test the hypotheses restricting the validity of the results. Third, a possible selection bias may have occurred indicated by the different level of previous knowledge at T1. Finally, the sustainability of the effects was not examined. Future studies should consider multi-method studies including more participants and follow up tests.

In order to meet the demands of teaching through argumentation, it is considered important that a teacher has first-hand experience with argumentative practices, either in pre-service or in-service training programs, which foster the development of knowledge and skills to assist in the future implementation of argumentation in science classes (Zohar, 2008). The use of VaKE in teacher education provides an appropriate possibility to address this aim despite the overloaded curricula and it also equips the pre-service teachers with a teaching approach they can use later in their classroom to enhance socio-scientific argumentation skills in their students. The question remains, whether teachers who know VaKE really use it in their classrooms.

An important implication from this study is to consider the moral considerations as an essential element of the quality of a socio-scientific argument. Although pre-service teachers are adept to construct arguments, when focusing primarily on knowledge acquisition the moral principles as justification for a normative claim become less important which in turn can decrease the validity of the argument. By using V*a*KE as a method to discuss SSI the moral considerations as well as knowledge are addressed equally providing the base for constructing valid socio-scientific arguments.

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# How Consumer of News Do Social Networking Activity Through Confirmation Bias, Value Relevant Involvement and Issue Relevant Involvement: Exploring the Implication of News Literacy

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# ABSTRACT

This research studies the correlation between the type of news consumers watch (fake news or factually based news) and news consumer's social networking activities such as clicking 'like', posting and sharing on Facebook, etc., through mediating variables such as confirmation bias and involvement (value relevant involvement and issue relevant involvement). This study presumes some personal factors like bias and involvement are mediating factors that affect social networking activities.

Firstly the research outcome showed that fake news readers didn't have full confidence in fake news that was composed of same subject and different point of view with factually based news (reliability of factually based news : M=2.99, reliability of fake new: M=2.45). Secondly, the respondents were influenced by confirmation bias independent of the type of news they were shown. A significant difference (t=5.76, df=241, P<0.001) of confirmation bias between factually based news (M=2.84, SD=0.58) and fake news (M=2.42, SD=0.54) was presented. Thirdly both news audiences demonstrated value relevant involvement (value relevant involvement of factually based news: M=2.90, SD=0.68, values relevant involvement of fake news: M=2.62, SD=0.66). Factually based news is higher than fake news on value relevant involvement and the difference is significant (t=3.24 df=241, P<0.01). However, issue-relevant involvement doesn't relate with either news type (real news: M=3.68, SD=0.75, fake news: M=3.55 SD=0.70). The social networking activities of real news audience (M=2.57, SD=0.87) is little higher than fake news (M=2.33, SD=0.75). Fourthly, this paper uses the regression analysis on the correlation between the type of news they watch (fake news or factually based news) and news consumer's social networking activities through mediating variables such as confirmation bias and involvement (value relevant involvement and issue relevant involvement). It showed that those exposed to factually based news were mediated by confirmation bias and value relevant involvement (F=22.432, df=118, p<.001) under 34.7% explanation power of social networking activities, and those exposed to fake news were mediated by confirmation bias (F=11.255, df=117, p<.001) under 20.4% explanation power of social networking activities. The implications of this study are as follows; users are not motivated to do social networking activities on news based on its factual content. Depending on the user's interest of news agenda, user is reliable of the news. News users don't have blind faith in fake news. Regardless of the factuality of news and the personal importance of an issue, users are influenced by bias and value and beliefs to do social networking activities (clicking like, posting, and sharing). Social networking activities are mediated by confirmation bias and value relevant involvement on the both news types. For the implication of news literacy, the result of research shows that news users need to develop critical thinking skills to evaluate evidence fairly and objectively. To reduce confirmation bias, one needs to reduce the psychological defense reaction and seek an emotional change. Value Relevant Involvement is also a defense mechanism to keep one's opinion. Confirmation bias and Value relevant involvement are personal factors that disrupt one's objective attitude for accepting news. It is important to help users fairly understand the news through educational tools such as debate, cooperative work and role playing games. These kinds of educational tools help users avoid misinterpretation, develop strength of interaction and acquire various samples for decision making.

Keywords: New value, News literacy, Confirmation bias. Value relevant involvement, Issue relevant involvement, Social Networking Activity

# INTRODUCTION

Social media provides users a choice of stories from different sources that come recommended from politically heterogeneous individuals, in a context that emphasizes social value over partisan affiliation (Messing & Westwood, 2012). Specifically with respect to social media and news consumption, social media news alters the context in which news reading occurs, providing a venue that promotes exposure to news from politically heterogeneous individuals, and which serves to emphasize social value rather than partisan affiliation.

In the 2017 Korea, the disinformation of fake news was spread across social media. Fake news means false or outright hoaxes that masquerade as "real news" in form and structure. Even if there was no factual basis to the news, many people believed this wrong information and shared the fake news with friends on social media.

When news consumers diffuse these ambiguous news stories with others through social media, the social influence is amplified leading to detrimental public opinion.

In the social and mobile media-driven digital age, news consumers need to develop critical thinking skills to evaluate evidence fairly and objectively. The responsibility of determining what is fake and what is real news rests primarily on the news consumers. One solution to news consumer is education about the principles and practices of press through news literacy instruction.

This study aims to research how news users interpret the news and do social networking activity. This research studies the correlation between the type of news they watch (fake news or factually based news) and news user's social networking activities through mediating variables such as confirmation bias and involvement (value relevant involvement and issue relevant involvement). This study presumes some personal factors like confirmation bias and value relevant involvement and issue relevant involvement operate as mediating on factors to do social networking activity. In searching mediating factors, this paper suggests which factors are focused for news literacy.

# LITERATURE REVIEW

## News Literacy: What is news? Or what is not news?

In the social media environment, the traditional news consumption mode where in people habituated themselves to a trusted source alters into the mode of consumption whereby news consumers can select news from a wide range of sources deemed by friends or fellow internet users to be interesting or important. Users no longer need to select a news source but they select the story itself including social recommendation. News consumers select socially relevant content when presented with an overwhelming number of news stories from which to choose. By this, news consumers restrict their access to the diversity of information and the fragmentation of the media environment polarizes individual-level attitudes (Stroud, 2010). Also it increases ideological homogeneity among party members, perpetuates the support of falsehoods (Kull, Ramsay, & Lewis, 2003), and alters the way consumers of partisan news sources react to threats (Baum, 2011). News consumers of digital media age seem to think socially shared valuable news as more valuable news. The meaning of news value which news consumers nowadays pursue is an important goal for news literacy education.

News values determine how much prominence a news story is given by a media outlet, and the attention it is given by the audience. Various researchers addressed the news value as being primarily composed of timeliness, conflict, popularity and effect, and secondarily as, curiosity, unusual things, visual spectacle and facilitation (Bastian & Case, 1947; Harris & Johnson, 1955; Warren, 1959; Crump, 1974; Golding & Elliot, 1979; Itule & Anderson, 1987; Mayeuk, 1993). Shoemake, Danielian & Brendlinger (1991) argued that newsworthiness indicators could be broken down into three general theoretical dimensions (deviance dimension, the social significance dimension, contingent condition-timeliness and proximity). Schudson (1996) referred to legitimate controversy, deviance and shared values. However relating to the attention audience pays, Whyte-Venables (2012) suggests news may be interpreted as a risk signal by audience. A 'risk signal' is characterized by two factors, an element of change (or uncertainty) and the relevance of that change to the security of the individual. In the view of audience the most important trait of news is personal relevance and interest on the security.

However both media outlets and audience consider news as the combination between facts and importance. Importance of news is easily judged by media outlet and audience. But the facts in the digital news era are not as easy to distinguish. Whether that news is factual or not is not obvious since the digital technology can easily change fake images and news into apparently real images and news. Also, as digital technology makes it easy to copy and distribute fake images, it becomes more difficult for news consumers to judge the news value. Though there are many criterions of news value, the facts are very important criterion of digital news value.

Tuchman (1978) defined the facts as the information being collected using professional techniques and accurately addressing news source and news gathering method. There were ways to verify the objectivity of the facts. That is to quote officially approved news source, use quotation marks and address a quite formal news format. The facts were the main criterion insuring the reliability of news based on accuracy and fairness.

"News literacy is the acquisition of 21st-century, critical-thinking skills for analyzing and judging the reliability of news and information, differentiating among facts, opinions and assertions in the media we consume, create and distribute" (Schneider, 2007). News literacy skills are essential to distinguish between fact and opinion in this ocean of data. News literacy would make students nurture a more informed citizenry. Students must be able to determine bias or the agenda of the writer. Reading out of their comfort zone will help students see other points of view, and be more tolerant and less emotional when discussing issues. In a democratic society,



#### informed decision-making requires that students develop news literacy skills.

Furthermore in the digital information age which refers to an era dominated by increasingly sophisticated digital media devices and transmission systems that have fundamentally altered and personalized the dynamics of information collection, interpretation, and dissemination, and in the contemporary news age in which fake news influences the democratic political order, it is very significant to know what themes and patterns emerge from the consumption of fake news from the standpoint of news literacy. For instance, how do news consumers recognize and interpret news value? When news consumers consider a wide variety of news as reliable news, which psychological mechanism is operating for understanding and acceptance of news? Many studies have investigated confirmation bias which is the desire to prevent and eliminate the psychological dissonance as psychological mechanism for selective exposure (Jonas, Schulz-Hardt, Frey, & Thelen, 2001).

#### Confirmation bias

People tend to seek information that they consider supportive of favored hypotheses or existing beliefs and to interpret information in ways that are partial to those hypotheses or beliefs. Conversely, they tend not to seek and perhaps even to avoid information that would be considered counter indicative with respect to those hypotheses or beliefs and supportive of alternative possibilities (Koriat, Lichtenstein, & Fischhoff, 1980).

Confirmation bias is the unconscious tendency to acquire evidence consistent with one's beliefs while ignoring opposing evidence. Confirmation bias is a phenomenon wherein decision makers have been shown to actively seek out and assign more weight to evidence that confirms their hypothesis, and ignore or under weigh evidence that could refute their hypothesis (Eagly, A. H., & Chaiken, 2005). Previous studies have shown that people who have strong beliefs and attitudes show a stronger tendency toward selective exposure and confirmation bias (Knobloch-Westerwick & Meng, 2009; Brannon et al., 2007; Hart et al, 2009). Previous empirical studies showed that the confirmation bias is extensive and strong in the information seeking and interpretation. The experimental findings are as follows: the first finding is the restriction of attention to a favored hypothesis(Nickerson, 1998). That is the tendency to give greater weight to information that is supportive of existing beliefs or opinions than to information that runs counter to them. This does not necessarily mean completely ignoring the counter indicative information but means being less receptive to it than to supportive information. The second finding is to treat preferentially the evidence that supports existing beliefs. Preferential treatment of the evidence supporting existing beliefs or opinions is seen in the tendency of people to recall or produce reasons supporting the side they favor on a controversial issue and not to recall or produce reasons supporting the other side (Baron, 1991, 1995; Perkins, Allen, & Hafner, 1983; Parkins, Farady, & Bushey, 1991). The third finding is looking only or primarily for positive cases. What is considerably surprising is the fact that people appear to seek confirmatory information even for hypotheses in whose truth value they have no vested interest. Fourth finding is about overweighting positive confirmatory instances. Studies of social judgment provide evidence that people tend to overweight positive confirmatory evidence or underweight negative non-confirmatory evidence. The last finding is seeing what one is looking for. People sometimes see in data the patterns for which they are looking, regardless of whether the patterns are really there.

The consumers of news seem to seek information that they consider supportive of favored views or existing beliefs and to interpret information in ways that are partial to those views and beliefs. Confirmation bias polarizes individual attitude, increases ideological deviationism, perpetuates the support of fake news, and alters the way news consumers react to news sources and act in the social network with friends.

#### Involvement: value relevant involvement and issue relevant involvement

The effect of persuasion will be changed according to how one perceives their involvement in an issue. Johnson and Eagly (1989) define involvement as a motivational state that is produced by the perceived link between an attitude and some aspect of an individual's self-concept. There are three types of involvement that each correspond to a particular aspect of the self-concept to which an attitude is linked. Impression-relevant involvement has to do with the self that one presents to others; thus, high impression-relevant involvement indicates a desire to hold a position that will be socially acceptable and thus create a positive public self-image. Outcome-relevant involvement, or, issue-relevant involvement, deals with the actualization of self, or the attainment of particular goals, such that high outcome-relevant involvement with an issue indicates that the issue is important to the attainment of immediate personal goals. Finally, value-relevant involvement deals with the deep element of self-concept which is drawn from social and personal values; high value-relevant involvement indicates a strong sense of a connection between the issue and important personal or social values (Johnson & Eagly, 1989). The more emotionally connected people are to an idea, concept, or value, the more minor differences in beliefs can be viewed as significantly large and perhaps lead to harsh judgments or to have stronger reactions. It concerns those behaviors which hold direct personal consequences at a premium for the individual and as a result, corresponds most closely to vested interest.



## Social Networking Activity

Social networking activity, public communication behavior in a specific situation is divided into information processing and information seeking behavior. Interactive communication behavior means seeking and sharing information actively (Grunig & Hunt, 1984). The active communication behavior demonstrates people's social power by expressing their opinion and delivering information which is monitored by mass media, online media and personal communication (Levy, 1987). This behavior is boosted in social media because people try to ensure their position through clicking 'like' or by commenting and sharing news which reflects their values and beliefs (Ma, Lee & Goh, 2014). Social networking activities mean seeking and sharing information actively (Grunig & Hunt, 1984). The interactive communication behavior demonstrates peoples' social power by expressing their opinion and delivering information which is monitored by mass media, online media and personal communication (Levy, 1987). This behavior is boosted in social power by expressing their opinion and delivering information behavior demonstrates peoples' social power by expressing their opinion and delivering information which is monitored by mass media, online media and personal communication (Levy, 1987). This behavior is boosted in social media because people try to ensure their position through sharing and commenting on news which reflect their value and belief. (Ma, Lee, & Goh, 2014).

#### **Research Question**

This study has several questions:

RQ1. How do news users estimate the reliability of factual news and fake news?

RQ2. How does confirmation bias affect news users who read factual news and fake news?

RQ3. How does involvement (value-relevant involvement, issue-relevant involvement) affect news users who read factual news and fake news?

RQ4. How does news user's social networking activity compare when viewing factual news and fake news?

RQ5. What is the correlation between news types (factual news and fake news) and news user's social networking activities through mediating variables such as confirmation bias and involvement (value-relevant involvement, issue-relevant involvement).

## **Research Methodology**

This study utilizes an artificial online news source with the same format and appearance as a real online news source: Huffington Post for this experiment named Voice of Korea. Two news articles, one factual news and the other fake news, are distributed via their respective URLs to surveyors through KAKAO TALK, a famous mobile messenger in KOREA. This study separated respondents (243 persons) into two groups each receiving either a factual or fake news article. After carefully reading the article, they clicked 'next' and then started the post-survey. The demographic features of respondents are composed of males (126 persons, 51.9%) and females (117 persons, 48.1%). This data has been statistically analyzed using SPSS Version 21.0. This study uses exploratory factor analysis to check the validity of survey questions included in each variable. A T-test was used to verify news reliability, confirmation bias, value related involvement and issue related involvement for each testing group. Significance level is p<0.05. Furthermore this study uses Multiple Regression Analysis to verify and ensure the correlation of confirmation bias, value related involvement, and issue related involvement and social networking activities.

#### **Research Result**

News user's news reliability of fake news and factual news is 2.99 and standard deviation is 0.67. Average reliability of fake news is 2.45 and standard deviation 0.80. The reliability difference of both groups is 0.54. It was significant as t-value is 5.80, degrees of freedom is 241 and significance probability is 0.000. Fake news users didn't have full confidence in fake news that was composed of same subject and different point of view with factual news. This result implies news users are able to discern between fake and factual news depending on their interest in the issue.

		Cara	News reliability							
_		number	Mean	Standard deviation	Difference of average	T-value	Significance probability			
News	Factual news	122	2.99	.62	525	5 802	000			
type	Fake news	121	2.45	.80	.333	5.802	.000			

Table 1 News user's news reliability of fake news and factual news

\*p<.05, \*\*p<.01, \*\*\*p<.001

The effect of confirmation bias to news users who read factual news and fake news is indicative that the respondents were influenced by confirmation bias independent of the type of news they were shown. A significant difference (t=5.76, df=241, P<0.001) of confirmation bias between factual news (M=2.84, SD=0.58) and fake news (M=2.42, SD=0.54) was presented. This result implies that people tend to accept news based on whether or not the news supports personal views and belief rather than whether news is created based on the



factual news source. The effect of value relevant involvement and issue relevant to news users who read factual news and fake news shows that both news audiences demonstrated value relevant involvement (value relevant involvement of factually based news: M=2.90, SD=0.68, values relevant involvement of fake news: M=2.62, SD=0.66). Factually based news is higher than fake news on value relevant involvement and the difference is significant (t=3.24 df=241, P<0.01). However, issue-relevant involvement doesn't seem relevant with either news type (real news: M=3.68, SD=0.75, fake news: M=3.55 SD=0.70). This implies that regardless of news factuality, people select news which is matching with their values and beliefs and the personal importance of an issue does not seem to influence their acceptance of the news.

Table 2 The effect of confirmation bias, value-relevant involvement and issue-relevant involvement to news users who read factual news and fake news

		Confirma	ation bias	Value- involven	relevant nent(VRI)	Issue-relevant involvement(IRI)		
		Mean Standard deviation		Mean	Standard deviation	Mean	Standard deviation	
Factual news	122	2.84	.58	2.90	.68	3.68	.76	
Fake news	121	2.42	.54	2.62	.66	3.55	.70	
Average difference		.4	15	.2	79	.135		
T-value		5.758		3.2	244	1.439		
Significance probability		.0	00	.0	01	0.152		
	0.4 deded	201						

\*p<.05, \*\*p<.01, \*\*\*p<.001

The social networking activity of news users who read factual news and fake news is not the same. The social networking activities of real news audience (M=2.57, SD=0.87) is little higher than fake news (M=2.33, SD=0.75). The audiences of factually based news are more inclined to diffuse the news through the social networking activities than fake news.

Table 3 Social	networking	activities of	f news use	rs who read	factual	news and	fake news
rable 5 boerar	networking	activities of	i news use	is who read	inactual	news and	rake news

		Casa	Social Networking Activity							
		numbers	Mean	Standard deviation	Difference of ave	T-value	Significance probability			
News	Factual news	122	2.57	.87	225	2.245	000			
type	Fake news	121	2.33	.75	.235	2.245	.000			
* .05 *	× 01 ++++	0.0.1								

\*p<.05, \*\*p<.01, \*\*\*p<.001

This paper uses the regression analysis on the correlation between the type of news they watch (fake news or factually based news) and news consumer's social networking activities through mediating variables such as confirmation bias and involvement (value relevant involvement and issue relevant involvement). It showed that those exposed to factually based news were mediated by confirmation bias and value relevant involvement (F=22.432, df=118, p<.001) under 34.7% explanation power of social networking activities, and fake news exposers were mediated by confirmation bias (F=11.255, df=117, p<.001) under 20.4% explanation power of social networking activities.

Table 4 The correlation between news types (factual news and fake news) and news user's social networking activities (like, posting, sharing) through mediating variables such as confirmation bias and involvement (VIR, IRI)

			Social Networking Activity							
		β	t	р	β	t	р			
(constant)			1.506	.133		057	.954			
	IRI	.120	2.115	.035	.101	1.855	.065			
mvorvement	VRI	.463	8.183	.000	.295	4.485	.000			
Confirmation bias					.298	4.517	.000			
adjusted R <sup>2</sup>			.233		.291					
F			37.828***		34.059***					

\*p<.05, \*\*p<.01, \*\*\*p<.001


### CONCLUSIONS

This paper expected that news consumer would do social networking activities such as clicking 'like', comment and sharing news mediated through confirmation bias and involvement (VRI and IRI).

First, this paper shows that news consumer is able to distinguish factual news and fake news on the proclamation of martial law after the impeachment of President, Park, Geun-hye in Korea. As the result of checking reliability, the reliability of fake news is low. This result shows news consumer doesn't consider all kinds of news as a source of information regardless of information quality.

Secondly, the news consumer exposed to factual news is inclined to sustain internal consistency based on value-relevant involvement. However, issue-relevant involvement doesn't provide this with either news type. This implies that the level of value-relevant involvement and issue relevant involvement is different according to the significance of current issue. On the impeachment of President, Park, Geun-hye, news audience was activated by value of common sense.

Thirdly, the news consumer exposed to factual news is inclined to click 'like', comment and share the news. Fourthly, the participation behavior as indicated through communication with friends was definitely influenced by VRI and IRI. However, confirmation bias coupled with involvement, especially VRI, boosts the effect of the desire to communicate. In my estimation, this may result from the fact that the impeachment of President, Park, Geun-hye is actually not related to the outcome merits and demerits but rather the democratic value for news audience because it is a massive issue that has shaken the foundations of the nation. News consumer exposed to factual news pursue active communication combining the confirmation bias and VRI but news consuemr exposed to fake news is activated by confirmation bias for an active communication on social media. That means they are either ignorant or have a clear purpose of manipulating public opinion.

Finally, both news groups of fact news and fake news are affected by confirmation bias to activate participation behavior on social media. But the news group exposed to factual news is mediated by VRI and IRI and the news group exposed to fake news is influenced only by confirmation bias. News consumer changes their strategy for communication according to the significance of issue and purpose of sharing of news. News literacy needs to focus on orienting news consumer's ideas toward news value and fact check.

### **Implication of news literacy**

Vested interest appears to affect people's tendency to overestimate the extent to which others agree with their beliefs, a bias known variously as the false-consensus or assumed-consensus effect. If people tend to overestimate the number of others who share their beliefs, this tendency will be exacerbated in situations involving personally consequential, or highly vested, beliefs.

As the research findings, users are not motivated to do social networking activities on news based on its factual content. Depending on the consumer's interest of news agenda, news consumers are more likely to believe the news. News users don't have blind faith in fake news. Regardless of the factuality of news and the personal importance of issue, users are influenced by bias and value and beliefs to do social networking activities (clicking like, posting, and sharing). Social networking activities are mediated by confirmation bias and value relevant involvement on the both news types. Confirmation bias is the unconscious tendency to acquire evidence consistent with one's beliefs while ignoring opposing evidence. These findings show that news users need to develop critical thinking skills to evaluate evidence fairly and objectively. To reduce confirmation bias, one needs to reduce the psychological defense reaction and seek an emotional change. Value relevant involvement is the tendency to maintain one's own values, ego and identity. This attitude is also a defense mechanism to keep one's opinion. Issue relevant involvement makes people misunderstand the news. Confirmation bias and value relevant involvement are personal factors that disrupt one's objective attitude for accepting news. It is important to help users fairly understand the news through educational tools such as debate, cooperative work and role playing games. These kinds of educational tools help users avoid misinterpretation, develop strength of interaction and acquire various samples for decision making.



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# ICT, Mathematics and Critical Thinking

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# ABSTRACT

The integration of ICT and Mobile Learning in Education is here to stay and evolve with the evolution of Technology and Teaching & Learning.

The aim of this study is to focus on the impact induced by the use of ICT, including mobile devices, on learners' Critical Thinking (CT) through the teaching and learning of mathematical concepts.

The literature is crowded with various interpretations and definitions of critical thinking which makes it a challenging Learning outcome to address and assess. Consequently, CT is broken down to its main constituent skills, which are then targeted and assessed separately.

A list of carefully selected mathematical problems are implemented and assessed within a class of undergraduate liberal arts students.

A comparison between a classic approach and an ICT based approach, while solving the same mathematical problem, is presented. The outcome of this study forms a strong evidence to show that the integration of ICT enhances the development of learners' critical thinking skills.

### INTRODUCTION

In the contemporary phase of education, the focus on developing learners' critical thinking skills has captured the attention of educators and researchers in all disciplines. Hence, the literature is rich with research work on Critical Thinking, however, definition and assessment of Critical Thinking is variably presented in the literature. In 2005 Richard Paul, investigated the state of Critical Thinking (Paul, 2005), concluding that: "Research demonstrates that most college faculty lack a substantive concept of critical thinking, though they mistakenly think otherwise". Further corroborating the lack of uniformity in the general understanding of Critical Thinking in education, Martha et al. (Stassen, 2011) stated that: "Critical thinking is an important learning outcome for higher education, yet the definitions used on campuses and national assessment instruments vary".

### METHOD

Following a thorough review of literature, the following definition of critical thinking has been developed and adopted for this study: Critical thinking is the ability and the disposition to understand, evaluate, and use information to explore issues, generate solutions to problems, and develop informed judgements. This has been broken down to its main constituent skills, which are the ability to:

- 1. Understand and Evaluate (Extract and understand given information)
- 2. Explore issues (investigate the links between the given data/information)
- 3. Generate solutions
- 4. Develop informed judgements of the results.

Generally, current assessment systems in mathematics concentrate on the two middle components: investigate the links between data and provide solutions. To support this statement, the following example is selected from a bank of questions used in recent exams.

### **Investigated Question**

A child, eight years old, inherited an amount of AED100000. The court decided that the money is to be placed in an investment bond until the child reaches the legal age of 18 years, according to the laws of their country. The following offers of investment are presented to you under the assumption that you are the legal representative of the child. You are required to make the appropriate calculations and provide the court with your written recommendations.



I) Show your calculations in the space provided below each investment offer.

II) Present your written recommendation in the available space at the end of your calculations. Note: all investment offers are based on an interest rate of 10%

- a) Simple interest calculated annually
- b) Compound interest calculated annually
- c) Compound interest calculated daily
- d) Compound Interest calculated continuously.

The grading system for this question gave an equal number of points for calculating each investment offer and some further points for stating the highest answer.

The same question was then rewritten by taking out the text shell that comprises the main mathematical question:

Modified Investigated Question

Calculate the future investment of AED100000 for 10 years at an interest rate of 10% in the following cases and name the best one.

- a) Simple interest calculated annually
- b) Compound interest calculated annually
- c) Compound interest calculated daily
- d) Compound Interest calculated continuously

The two questions were presented to the same group of students as part of a quiz and was repeated with other groups of students, the same grading system was used in both cases. Hence, the following results were observed.

- For the text-loaded question only 25% were able to demonstrate an understanding of the question and solve the problem.
- For the Modified question 65% were able to completely solve the problem.

In analyzing the results of this exercise, the following point is raised:

The ability to understand the text-based question was hindered by language and cultural abilities. If these skills are not introduced during the teaching of the course, why would they be included in the question? Furthermore, if they are to be included in the teaching, then they should be included in the assessment/grading scheme.

Linking this finding back to the four constituent skills of critical thinking, when answering the modified question, the students were demonstrating the ability to extract the relevant information from a given problem (1<sup>st</sup> component) and to create clear links between the data and information (2<sup>nd</sup> component), enabling them to provide a solution (3<sup>rd</sup> component). The simplification or de-cluttering of the question, therefore, enabled a clearer understanding and, hence, the quicker execution of the first two constituent components of critical thinking.

Another exam question was designed with the aim of comparing classic and ICT based approaches for solving a given mathematical problem.

Solve the following example using classic algebraic and calculus techniques: A company making miniature garden fountains has found the cost function (in Dirhams) for making x units per week to be:

C(x) = 5750 + 240x - 0.05x2

a)

- Find the marginal cost function.
- b) Find the marginal cost of making 300 fountains per week.
- c) Find the cost of making the 301st fountain.

The same question was presented to the same group of students as follows: Solve 'the same question above' using the your Mobile or any other ICT device and explain the obtained results.



This modification resulted in a 25% increase in the average score for this question; the question was constructed to direct students' thinking into the 1<sup>st</sup> and 4<sup>th</sup> components of Critical Thinking; achieved by removing the need to dedicate time to the application of mathematical techniques. The students, therefore, were able to dedicate more time to the analysis of the information and the interpretation of the results.

The outcome of this study forms a strong evidence to show that the integration of ICT enhances the development of learners' critical thinking skills.

In summary, it has been demonstrated that the presentation of the question has a significant effect of the students' ability to correctly answer the question. Language and cultural skills are not taught as part of the course, nor do these skills form part of the assessment. By efficiently structuring the question and thus, removing the requirement to apply these skills, we are firstly, removing a potential hindrance and secondly, more effectively analyzing the use of critical thinking.

The ultimate goal is for the student to be able to provide an informed judgment of the results. Therefore, the removal of the need to spend a significant amount of time (Ennis, 1997)on the comprehension aspect of the question (a linguistic skill) allows them to spend more time on the application of the other steps of the critical thinking process.

Similarly, removing the need to apply time-consuming mathematical techniques during an exam will afford the student more time to critically analyze potentially complex scenarios or to form judgments on the resulting data. Thus, the assessment will focus on the students' application of the critical thinking process.

It can be concluded from this study that the manipulation of the question can have a significant impact on both, the ability to demonstrate and the ability to accurately assess critical thinking. The incorporation of ICT can encourage the application of the critical thinking process by reprioritizing students' time-allocation to problems; whilst, by the same mechanism, alleviating some of the issues that arise as a result of inefficient question structuring.

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# Improving the Quality of Marginalized Schools through Organization Development:A Case of EMRP's School-Based Education Management Intervention

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# ABSTRACT

This paper discusses a school improvement strategy used to improve the teaching-learning processes in a group of marginalized schools in India and presents a case of EMRP (hereafter referred as Education Management Resource Program), a partnership of a business school with marginalized schools to drive their academic and administrative performance. EMRP is an education management experiment to enable interventions to promote leadership efficiency and to boost academic performance of students of underprivileged schools. This paper approaches the concerns and challenges of these schools and delineates the EMRP strategy of school improvement to help identify the enablers for school development and to recommend constructive approaches to school reform for potential enablers of holistic teaching-learning processes which can ensure quality education within the given constraints. This paper offers a reflection on how a school reform strategy oriented in the administrative management of a school can transform the academic potential of an underprivileged school and posit the school's growth manifold in terms of its academic and institutional development.

Keywords: organization development, education management, leadership, school reform, teachinglearning processes, business school partnership

### INTRODUCTION

It is not very often that a business school collaborates with marginalized schools to help them manage their affairs. Education Management Resource Program (hereafter referred as EMRP) is a unique partnership which takes shape when seven schools in Mumbai (India) and eight schools in Ahmedabad (India) are adopted by a business school to impart training in leadership, management and administration to facilitate administrative and academic efficiency. These marginalized schools serve the disadvantaged minority students who are underprivileged and these schools promulgate scorecards which lack scholastic brilliance as compared to their mainstream students. Therefore a partnership was forged between these schools and EMRP, NMIMS which is an education management program of a business school to help implement a program of school improvement which was aimed at helping the school leadership in enhancing the quality of administration and teaching resources while managing student performance in a highly competitive academic milieu. The raison d'etre of EMRP's school management program was to build management and leadership competencies amongst senior teachers to help school administrators in designing school development plans which will reinforce the curricular offerings. This is a unique organization development approach which supports systemic change in select schools. While conceptualizing the EMRP program, a vision of an ideal school was embedded in its school improvement design, which responded to the challenges faced by the marginalized schools and sought to create a model school which not just improved scholastic performance of its students but which also reinforced a holistic model of academic and extra-curricular development.

It is imperative that school education focuses on managing socio-economic aspirations of its stakeholders. While marginalized schools struggle to provide good quality education to their students, they often lack the resources and the infrastructure to do the job. EMRP was driven to mobilize the resources and provide the necessary support to galvanize the performance of these schools and to enable the stakeholders in achieving their desired thresholds of efficiency. It is thus interesting to explore the strategy of EMRP to boost education management and to provide impetus to the academic development of its constituents. This paper explores the journey of EMRP in shaping the destinies of these marginalized schools through a cross-fertilizing partnership which leads to the emergence of a model school which can compete with premiere mainstream schools. This partnership is a saga of an institution of higher education which collaborates with an institution of basic education to be an enabler of its growth.



This maps the synergy of a business school's partnership with schools to foster school-based interventions to create structures, so as to facilitate management administration and to enable the achievement of higher competencies through institutionalization of academic and leadership enablers. Chua & Mosha (2015, p.1), based on their study of schools in Tanzania, similarly concur that performance of schools can be ascribed to the type of management found in a certain school which allows for functional mechanisms to accelerate teaching-learning.

### The EMRP design of school reform

The EMRP strategy approaches school reform through a management practitioner's lens. It picks up school reform as an agenda of improving school effectiveness through improving structures, policies, systems and inclass teaching-learning processes. It emphasizes organizational development as a system-wide change process to initiate deep-rooted changes and to institutionalize such changes for potential development. Organization Development is a theoretical assumption, a method and a value system (which may be covert) for creating improvement in the human side of organization's life and thus improvising the achievement of task-goal of complex organizations (Derr & Demb, 1974, p.11). It helps conceptualize a school as a corporate organization and uses HRD tools and techniques to achieve synergies amongst both external and internal stakeholders. This allows a practitioner an opportunity to use both a structural and an agency perspective for conceptualizing school improvement. A major benefit of such work is that this helps the school stakeholders to grasp the structural and common aspects which facilitate change but a major challenge could be that sense making of school-specific stakeholders such as teachers, along with their individual professional work, may get lost (Blossing, et al. 2015, p. 9). This approach emphasizes school as an organization and attempts a systems design approach of organizational development. It implies that a small or an inconspicuous change may manifest itself in repercussions which are organization-wide and which lead to unpredictable and dramatic consequences. While leveraging upon systems thinking, it is critical to focus upon critical areas which provide a forceful rationale for making such improvisations and mitigates chaos and scattering of limited resources such an approach focuses on few key areas and reduces the number of changes one must direct at any one time and provides a compelling rationale for making these changes. It also reduces confusion amongst stakeholders by carefully restructuring the inter-stakeholder relationships and thus limits the dispersal of inadequate resources. This paradigm allows successful schools to perennially restructure its system to integrate itself into a systems framework (Haines, 2000, p.10). This provides a perspective on how teachers will be held responsible for the student's performance and a principal will compensate the teacher for one's contribution.

EMRP, in its initial diagnostic phase, generated information about the schools and identified system-specific issues and challenges. Each school had its unique ecosystem which needed to redirect its symbiotic interdependences to create synergies which would augment their performance. A need-based school reform program was conceived and each and every school mapped its current position in terms of key result areas such as academic performance of students in school-based as well as public exams, enrolment levels of students, student-teacher ratios, and extra-curricular development of students, infrastructure, academic resources, principal-trustee relationship and parent-teacher relationships. It is significant to note that each aspect of school functionality was carefully picked to be redesigned and to engage stakeholders in holistic school development. A strategic perspective was introduced to help schools think about macro-level changes through proactive action planning rather than merely combating day-to-day fire fighting. Contingencies of academic and non-academic nature were anticipated and structures were conceived to enable systemic changes through gap analysis and encouraging participants to think of the existing school system in its current state and to plan the transition to a desired state. Moore (2011) observes that understanding where an organization rests currently and what processes it will need to bring about change or transform is the leading step to introduce the change in business processes (p.4). EMRP conducted a gap analysis to help schools understand their current positions and used baseline data to help these schools understand the challenges of such a position. Based upon the current levels of performance, stakeholders were encouraged to design plans for desired expected outcomes. This compelled the school administration to develop multi-year plans to help them to anticipate changes they wish in their school environment and to work in a systemic manner to achieve such change. This helped them develop long-term plans (for as long as five years) to manage process improvements and to influence their outcomes through

facilitating both system effectiveness and stakeholder efficiency.

Here an important assumption is that change, both planned and unplanned depends upon the assumptions that people who are invested in such change processes make about organization development. Using Schien's analogy of the peeling of an onion, where one can see the external skin of the onion which represents the stakeholder behaviours, but without peeling away the layers between the external skin, and the core of the onion which epitomizes assumptions, one cannot understand the onion which is representative of the people of an organizational system (McLean, 2006, p. 8). The Organization development strategy of EMRP focused on people behaviours and assumptions of stakeholder beliefs, values and attitudes to refashion the organizational capacity, which included redefining vision and mission and core values of the system. If organization's current culture does not support its strategy then one needs to introduce interventions to transform its culture. Culture may thus be one of the most forceful determinant of a school's culture (Owens, 2004, p. 191). This implies that a school's culture and climate may intermingle with the school improvement process in myriad ways and at all levels of that improvement process (Lindahl, 2006, p.6), and hence culture in terms of people elements and system- specific structural and technological elements will have to be integrated with the strategy for implementing the foreseeable change.

### Identifying the Challenges faced by partner schools

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While setting the stage for change management, EMRP identified the problems and issues inhibiting organizational efficiency of partner schools. Most schools lack infrastructure and resources to provide quality education to students and hence EMRP had to investigate the challenges which inhibit the development of these schools. It is interesting to note that all schools had several major inhibitors of school improvement which needed immediate attention. High absenteeism rates amongst schools students was a key area of concern as parental indifference and difficult curriculum without adequate resources to aid student learning led most schools to report absenteeism rates that were phenomenally higher than mainstream schools. Many students also dropped out due to lack of interest in pursuing their studies as well as for economic reasons. Often the academic performance of these schools, especially in public exams was abysmal. The board of management did not repose trust in the principal and hence often school principals were not satisfied with their roles and authority structure. At times due to lack of availability of management resources, many schools faced the issue of inadequate planning. In EMRP schools, inefficient classroom management was rampant due to an extremely poor teacherstudent ratio. Research indicates that effective teachers take time to implement rules & procedures and do not force these rules and procedures upon students but create these with the students (Marzano et al., 2009, pp.5-6) to improve classroom processes, but EMRP schools could not demonstrate any such participative mechanisms as these schools had one teacher and nearly 50-70 students in each class. Poor school administration with a lack of discipline was a common feature in most of these schools. Since very often senior-most teachers assumed the mantle of school leadership, they often lacked administrative and leadership experience, resulting in inefficient school administration. Conventional teaching methodology, coupled with solely academic emphasis without any extra-curricular development opportunities for students led to school dropouts as well as absenteeism and even lope sided development of students.

Teachers of EMRP schools felt disengaged and were not adequately empowered. There was limited networking with other professional colleagues, and thus most EMRP school teachers were not acquainted with pedagogical innovations, and often worked with conventional classroom resources. The school staff suffered from low morale and were often demotivated with no opportunities for self-development. EMRP strategy had to be oriented in the belief that for effective professional development, schools will have to institutionalize a culture for learning amongst the members of the teaching community (Blandford, 2000, p.8). Infrastructure Management and over-all resource management of these schools left much to be desired with unclean premises and inadequate facilities and maintenance support. EMRP's strategy of school reform would posit its contribution to combat all of these issues and challenges besides introducing structures, processes, systemic interventions and peoplecentric practices to enable these schools to enhance their competitive advantage by improving quality of education and school management.



### **Organization Development strategy of EMRP**

As an external change agent, EMRP was a catalyst to initiate long-term developmental planning and change and helped EMRP schools adopt numerous system, process and behavioural interventions overs several years to implement its school improvement plans. EMRP consultants, along with the principal and senior teachers conducted an organizational diagnosis and identified key problems which a school encountered. This was an important first step in understanding the nature of problems and ascertaining current level of organizational effectiveness. Discussions with important functionaries of the school helped the consultants in diagnosing the current level of organizational readiness for change as well as interventions needed for change (Mcfillen et. al, 2013, p.223). A Gap analysis, conducted by EMRP consultants, revealed major strengths and weaknesses (Brown & Harvey, 2014, p.156) of these schools and helped in ascertaining the role of each stakeholder in school development plan.

EMRP institutionalized several interventions at organizational, group and individual levels to help practitioners achieve pre-identified outcomes. A series of structural interventions were planned such as redefining tasks, structures, work interdependencies (such as forming time-table committees, and Parent-teacher associations) and finally redefining roles and responsibilities of important personnel. Each school was helped in refining its vision and in developing plans for the future. An effective school management plan was developed to help institutionalize behavioural, process and task-based interventions to help schools perform at par with mainstream schools. In the throes of transformation, organic systems continue to engage in self-organizing and sense-making (Rothwell, 2016, p.56).

Training was used extensively to enable key school personnel in achieving the desired competencies in areas of classroom management, leadership, team-building and communication. Continuous training helped in building necessary skills and in weeding obsolescence. Training outcomes could be cognitive, behavioural, affective, and motivational (Gally & Chen, pp.5-6). Self-development of principals and teachers facilitated organizational renewal. Change needs a new way of working and hence needs an organizing architecture, or else it would be difficult to sustain this change. In times of change, organizations will have to transform their structures for strategy renewal. Hence most effective organizations will reorient themselves to boost their employees' capabilities so that talent of their employees is most pertinently used (Gaertz et al., 2002, pp. 3-4).

EMRP conducted organizational mirroring activities with different groups of functionaries of EMRP schools. Interactions amongst various important inter-dependent groups such as examination union, trustees, examination paper-setters, and even Innovative Teachers' Forum (INTEF), helped sensitize these stakeholders to each other's roles and also allowed a process of sorting out assumptions and expectations of one another. This intervention helped in conflict-resolution through dysfunctional mirroring by reinforcing boundary differentiation amongst these groups and individuals and this helped these different role-holders in augmenting their capacity to adapt to their assigned organizational tasks and to acquire greater role sensitivity about role-making and role-taking (Nitsun, 1998, p.245).

The partner schools were encouraged to engage in survey-feedback activities as EMRP recommended that research should aid in generating a dependable database which will lead to effective problem-solving through accuracy in need analysis. A community of school-based researchers was fostered to identify and solve school-specific problems through investigation of problems locally by conducting small independent research studies. These teacher-researchers were responsible for bringing innovative approaches in teaching-learning processes and in recommending solutions to challenging problems. Bernstein (1999) opines that pedagogy is a continued process, wherein an individual creates innovative forms of knowledge or develops current forms of behaviour, knowledge or praxis, and criteria from someone which is considered to be a qualified provider and assessor (p.259). While such pedagogic cross-fertilization allows for curricular knowledge to be applied to everyday life contexts (Koosimile, 2004). School teachers worked collectively to generate resources which could be developmental pedagogic tools and which could be used to enhance the quality of teaching-learning processes in the classroom. They were also the catalyst for implementing change and in facilitating organization development processes.



#### Institutionalizing Interventions for systemic change

EMRP was the external consultant to partner schools in order to implement Organization Development and to create sustainable change in these organizations. Human resource development was initiated and which focused on reinforcing relationships amongst the different constituents of school while developing people resources. A systems approach to organization development was attempted to engage all the departments of a school in a holistic model of professional development, which made each school think of itself as an integrated whole which will need to act in a synchronized manner to achieve its objectives. Beer & Huse (1972) recommend that structural and interpersonal transformation must complement and strengthen one another. Moreover learning in adults commences with behavioural changes rather than cognitive transformation (p.79). EMRP's organization development strategy includes an array of interventions to promote adult learning and to help the school emerge as a professionally mature organisation. These interventions include an intervention of a core group of teachers, which is a teacher-centric think tank of the organization to empower the teachers in curriculum planning, timetable setting, innovating pedagogic tools, classroom management, and forging better teacher-student and parentteacher relationships. Focused training was imparted by EMRP as an education management consultant to help schools achieve higher benchmark competencies in each of the pre-identified areas of performance. Each outcome of these activities was linked to the student's academic performance. A baseline competency indicators were mapped against benchmark competency indicators to demonstrate achievement of necessary levels of proficiency.

Another important in-class structure, which was used to facilitate peer learning was "student cluster". Student clusters allowed a teacher to create clusters of hand-picked students wherein brightest students of the class collaborated with academically slow-performing students. A student with poor academic performance was allowed access to buddy resources to help him cope up with the rigors of school exams. Since peers are accessible and they have insights into the learning challenges faced by fellow-classmates which even teachers' lack as subject-matter experts and thus peers have the ability to understand a laggard student's perspective (Maheady, 1998, p.6). Peer learning was especially useful while teaching subjects in Math & Science disciplines to students who were first generation learners and who had no access to any supplementary learning resources at home. Both core groups and student clusters were interventions which dealt with process and content issues and allowed teachers and students to build structures within the school system to drive long-term change. These quality improvement approaches were essentially linked to a database of baseline data about the participants' past performance and recorded their current performance in an ongoing cycle of data management. This was useful as a school principal could monitor one's school's scholastic performance in terms of strategically available roadmap to address contingencies as needed and to deliver results. This also made available a snapshot of comparative analysis of the school's performance in terms of examination results, attendance, school dropouts, and teacher-student ratios.

The Parent-teacher association of EMRP was a tool driven to foster better relationship amongst parents and teachers of these EMRP partner schools. Parents attended meetings with teachers to address common issues of concern in terms of academic performance, in-class challenges faced by students, teaching-learning resources, and even issues related to personal adversity of underprivileged groups of students. It tackled issues of students' health and well-being and even dealt with problems such as mental health, malnutrition, and in some cases part-time employment of students after school. This was an opportunity for the school to intervene in the student's home environment to support a holistic development and to specifically deal with parental issues such as illiteracy, alcoholism, unemployment and domestic violence.

An Innovative Teachers' Forum (INTEF) for promoting school-based research advanced reflection and research and helped bring innovative approaches in teaching-learning to schools. A networking opportunity unfolded to teachers and enabled cross-pollination of ideas and dissemination of resources. Often teachers discussed their research and participated in events where invited guest experts exchanged contemporary trends in education. EMRP library was an extension of this intervention which was a repository of important academic resources and which loaned teaching aids, books and other media such as films and audio-visual aids.



#### Exploring the identity of an EMRP school student

An EMRP school student most often hailed from a poor disadvantaged background without any financial means to provide for education and hence sought education in a school with nominal tuition charges. A representative student profile would be that of one who lives with a large family in a metropolis such as Mumbai or Ahmedabad, with many siblings and uneducated parents who cannot participate in the child's academic development. Often this student has to work as a domestic help, as a garage helper or even as a waiter to supplement one's family income. Some of these students may be indispensable to their family's income as they might have lost a parent early in life. Such children, at times, also suffered from mental ill-health due to unreasonable pressures they faced at a very young age as a consequence of adversity and family circumstances. Quite a few of these students were addicted to chewing pan (betel leaves) and Gutkha (i.e. Gutkha is a powdered mixture of arecanut, tobacco and lime), often exposing themselves to additional health hazards such as mouth cancer. Developmental Psychology framework acknowledges that various contexts and settings in which students are nurtured, for instance, families, communities and schools, all mould their behaviours, attitudes and experiences (Rumberger, 2011, p.8.), and impact their academic performance. Since they could not afford two meals a day, they often attended school on a hungry stomach. They were not motivated to complete their education and often struggled in their academic performance. Their attendance was often frustratingly low and their parents showed no interest in sharing any responsibility in counselling their children. The teachers often doubled up as a teacher and as a parent as well, thus helping the student to complete one's academic journey responsibly. Despite academic brilliance, some students had to face growing family pressures to give up their studies, as their parent were not interested in contributing even nominal tuition fees. Parents of girl children were eager to get the child married at a young age. There were 30% student dropouts in these schools. Research indicates that the professional capacity of the teacher is critical in defining the learning experience of the students, and is of a greater impact than other factors such as socio-economic background or the curriculum (Darling-Hammond, 2001; Hattie, 2003; Rowe, 2003), and EMRP's research established this fact.

#### **EMRP's Model of School Reform**

Using a holistic approach to school improvement, an EMRP school improvement plan involved including all the stakeholders so that every facet of school development is impacted positively. This included both external and internal stakeholder such as teachers, parents, principals, trustees, students and even administrative and support staff. EMRP's thrust was to enable a common understanding amongst these different stakeholders about organizational vision, mission, plans, and strategy and future objectives. A holistic school improvement allowed synergies amongst key stakeholders and also aided in system integration. Principal, as a key administrator, was essentially the pivot of EMRP's strategy and he or she was the change champion for creating the necessary environment for implementing change. School leaders face responsibility pressures in a "results-driven" setting. While external pressures mount, school leaders need comprehension, skill and resilience to reinforce their institutions (Bush, 2013, p.18).

While school leadership was significantly the prime mover of all EMRP strategic initiatives, he or she also had the responsibility to galvanize a team of catalysts who would implement the desired change. EMRP prepared Action Learning Programmes for principals and facilitated training in institution-building to reinforce higher leadership competence amongst school leaders. Moreover, developing leadership capability is the critical factor in nurturing capacity for school improvement (Harris & Lambert, p.8). A slew of interventions such as strategic planning workshops, training programs on decision-making, leadership and other team-building as well as role-driven interventions were designed and implemented to foster role clarity and these interventions were significantly important in moving the school principal's perception of one's role as that of a fire-fighting administrator to a proactive participative leader and an informed institution-builder.

Use of school Management Information System (MIS) in monitoring and evaluating the progress of schools was crucial first step in building systems within the schools to capture information about critical areas of school operations. Schools were guided to capture information about the examination processes and drop -out rates. For instance, all schools were encouraged to capture the academic performance of students in grade VIII & grade IX, so that performance of students in important subjects, such as Math and Science, can be carefully monitored to prevent failures and school drop-outs.



In fact, monitoring the drop-out rate through internal MIS helped EMRP schools in reducing their drop-out rates substantially. School staff was trained in capturing the MIS and in accessing relevant information for crucial decision-making. In fact baseline data was used to compare the current academic performance of the schools in pre-identified areas with previous year's academic performance to understand the impact of school-based academic improvement strategies. School MIS provided a framework for review of their existing work and for initiating future changes, as and when needed.

Research was an important facilitator influencing the quality of education in EMRP schools. EMRP encouraged partner schools to undertake research in significant areas of school improvement which were pre-identified during the organizational diagnosis. An exhaustive analysis of examination results was attempted on a periodic basis. This tracked the variability in academic performance in case of each student, the extent of co-relation in performance of the group amongst different components, while closely monitoring the performance of the lower 20% of the class. An efficiency index was developed for system performance as well as student performance.

Triage, a classroom-based teaching intervention, identified the groups of academically weak and very weak students and provided coaching for improvement in academic performance. As a consequence of special coaching weak students improved in their academic performance and very weak students did not show any improvement. With the help of this research, schools redefined their classroom strategies and created class-room structures to modify academic inputs and to enhance academic performance of weak students. Schools were encouraged to study dropout rates of students. It was a common assumption that students drop out due to socio-economic factors since a majority of EMRP School students hailed from underprivileged backgrounds. But research revealed to the contrary. It was established that a high rate of drop-outs was simply due to uninteresting manner in which academic instruction was delivered or the students found it difficult to cope up with the rigors of the academic routine.

EMRP conducted an organizational climate and health study with schools in Mumbai and Ahmedabad. Since of the 89 participating schools, 15 schools were EMRP schools, it was possible to compare these schools with other schools in terms of their organizational culture and climate. A benchmark for North-West Mumbai schools was set up for organizational climate and health and each EMRP school was compared with the benchmark school. It was an approval of EMRP's school reform strategy as the research confirmed that EMRP schools performed better on key organizational culture and organizational climate indicators as compared to a typical North-West Mumbai school.

### CONCLUSION

EMRP schools in Ahmedabad achieved excellent academic performance due to EMRP interventions and also demonstrated a strong potential for organization development through sustained systemic change and by implementing a select interventions in various areas of school improvement. While schools in Mumbai remained focused on the academic performance, schools in Ahmedabad emerged successful in reinforcing school network through a platform for peer networking and exchange of ideas and innovations. These schools showed a dramatic improvement in academic performance with examination results in Ahmedabad moving from a measly 2.5 % to results as high as 60-85%. In Mumbai, EMRP schools showed academic results as high as 99-100%. Extracurricular aspects of school performance have also been amazingly robust subsequent to EMRP's partnership with these schools. Significant structures to facilitate on-going networking and to create holistic transformations in order to enable schools emerge as an organization have been set up at partner schools. Some of these such as Core groups, Student clusters, INTEF, Teacher Resource Centre, and Examination Union have fructified as hubs of inter-school partnership in collaborative pursuit for excellence in education. School principals have emerged as successful institution-builders and teachers of these schools have morphed into innovative pedagogues. School administration and management has seen qualitative improvement in terms of leadership potential and the school's ability to manage its affairs better. Organization development has reinforced the partner schools' capabilities in terms of structures, policies, processes, systems and even personnel, to help these schools optimize their objectives. This partnership of a business school with a school has been a journey of complete transformation of schools as organizations and has successfully achieved what Kegan (2008) proffers:

...genuinely transformational learning is always to some extent an epistemological change rather than merely a change in behavioural repertoire or an increase in the quantity or fund of knowledge (p.48).



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# Index of Self-Efficacy for Learning How to Conduct Research: Psychometric Properties

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### ABSTRACT

The present research work develops with the aim to estimate the properties psychometrical a scale that measures the self-efficacy for the learning of the research. Took part 1304 university students whose average age was 22 years. The study was realized in three phases: Phase 1: descriptive Valuation of the ítems. Phase 2: Analysis factorial exploratory, and the Phase 3 was the estimation of the Analysis Factorial Confirmatory. As a result an instrument composed of three dimensions-factors explaining 70.03% of the variance associated with the construct under study is obtained. According to Cronbach's alpha of .866 and .864 McDonald's Omega it is considered that the scale presents a high level of confidence.

**Key words**: learning research; psychometric properties, self-efficacy; University students; Exploratory factor analysis; confirmatory factor analysis.

# INTRODUCTION

Thinking that the research is a fundamental axis of the university education, the present study plans like target to estimate the psychometric properties of a scale that measures the self-efficacy for learning of the research, process that constitutes itself in an indicator worldwide considered of occupational training, institutional progress and university position. This research reveals the latent variables involved in the adhesion of the student to the research, since if it is assumed that the ideas are generating of conducts, then to understand the constitution factorial of the construct suggests its potential intervention and adjustment to raise the yield of the student in the execution of the activities inherent in the research. If tutor extrapolates this contribution to the dynamics, the scale will allow identifying explanatory parameters of the performance of the students of different formative programs, doing that the accompaniment of the same ones is more differentiated and focused within reach of the research goals planned.



Although self-efficacy scales were identified in the academic context and its kindness in the prediction of the student success (García, English, Torregosa, Ruiz, Dís, Pérez and Martínez, 2010; Oláz and Pérez, 2012; Adorn them, Target, Gastélum and Muñoz, 2013) its linked collision of a specific way to the research is scarce, being only the published ones by Carot, Carranza, Oláz and Ponce (2012); Díaz, Manrique, Lady's man and Apolaya (2008) and Sander (2005). In this sense, it is considered that the production of this instrument favors the functional exploration of this line of research to the power to have a modality of measurement of the self-efficacy for learning of the research before potential interventions in the context Psycho-educative, where the reflection is promoted on the ideas of efficacy like way for the benefits securing in the execution of the task as it is brought by the researchs of Paolini and Bonetto (2013).

# METHOD.

# PARTICIPANTS.

The sample was shaped by a whole of 1304 students of the Academic Unit of Social sciences of the Technical University of Machala, Ecuador. As for the sex, 61.7 % (805) was women and 38.3 % (499) males. The average of the age was 22 years, with a typical deviation of 6.54. The selection of the students was done in function to the ascription career, remaining distributed of the following way: Plastic arts: 3.3 %, Social Communication: 7.4 %, Educational sciences Mention: Physical culture: 7.4 %, Basic education: 8.4 %, Initial Education: 7 %, Teaching in Computing sciences: 4.4 %, Social sciences: 2.3 %, Physics and Mathematics: 0.9 %, English: 1.7 %, Language and Literature: 2.4 %, Educational Psychology and Vocational Orientation: 2,5 %; Clinical psychology: 14,9 %, Jurisprudence: 13,7 %; Environmental management: 9,5 %, Sociology and Political sciences: 5.4 %, Social work: 8.8 %.

# **INSTRUMENTS**

The Inventory of personal beliefs of Research (CREPSI) remained composed by 11 items constructed according to the recommendations of Bandura (2006) about the dimensions and sources of self-efficacy. To answer the items 5 answers alternatives were selected with base in the frequency criterion, since the reiteration of the idea in the conscience suggests the activation of behavioral processes, which in sum reveal the implied logic of the concept of self-efficacy: "ideas that generate conducts". The options remained represented of the following way: To = Never, B = Seldom C = Sometimes D = Most of times E = Always. The allocation of the values continues a sequence of 1-5 respectively for the positive items. In case of the negative items, an investment of the values was realized. The statistical evaluation of the items was realized in three interdependent phases.

Phase 1: it implied the descriptive analysis of every item considering the proportion and/or answers frequency in the categories of each of them, to make sure that every item should be a variable and not a constant. Also there were valued the measurements of central tendency, dispersion and form, to obtain a global vision of the distribution of the information. An interrelations counterfoil was generated policóricas between the items to assure the applicability of exploratory and confirmatory factor analysis. Of equal way normality tests were realized single-variant of every item using the test of Kolmogorov and Smirnov, to assure the applicability of diverse methods of extraction of factors of the AFE, of which it shows itself in this first part the abstracted communalities.

Phase 2: Exploratory factor analysis (AFE) to the obtained information, of applying instrument to 1304 students, in order to reveal the set of latent variables that compose it. The evaluation of the model factorial was realized according to the following indicators (Lloret, Ferreres, Hernandez and Tomas, 2014; Pere and Lorenzo, 2014): a) Estimation of the adequacy of the information for the development of the factor analysis, by means of the test KMO and the test of Bartlett's sphericity; b) Method of securing of factors: Not exaggerated square minimums (ULS), applied on the counterfoil of polychoric interrelation. The selection obeys that the results are not vulnerable to the measurements of the variables (Freiberg, Stover, Church and Fernández, 2013); c) Rotation by means of the oblique method Promin (Lorenzo, 1999); d) Saturation factorial superior to.5; e) 3 to 4 items minimum for factor; f) Average quadratic residue ("Root Mean residual Square" RMSR) by means of closeness with the Kelley criterion;

f) Index of fitting criterion (GFI "Goodness of Fit Index"). Additional to it, in this phase there is estimated the reliability of the model proposed, calculated from the alpha of Cronbach and the Omega of McDonalds. Phase 3: Confirmatory factor analysis (AFC) of the structure of the model. This phase confirms the hypothesis that is formed by means of the AFE with regard to the factors and you show that they load in these. Basically the idea is to shape the functioning of the reality from the incorporation of the assumptions and restrictions that are in the population; this way, the model thinks about how to fit from a way reasonably suitably (Cambric, Coenders and Alonso, 2004; Pérez and Chacón, 2000). The model expresses itself graphically in the mail between latent factors - dimensions and the variables observable (items) so that major adhesion should be demonstrated between them. Every item must saturate in the factor of the one that supposes a valid indicator.

For the calculation of the exploratory factorial analysis, the counterfoil of the information there showed a satisfactory adjustment in the value KMO =.863 and the Bartlett's test of Sphericity equal to 4669 (p <.000) indicating that the interrelations counterfoil is different from the counterfoil identity. The factorization method employee was the ULS for the robust thing that proves on having estimated factors in adverse situations (Lloret et to., 2014). A solution was obtained factorial shaped by three factors that there explains 70,03 % of the variance associated with the construct in study. The factorial charges observed (see Table 2) are located over.05, indicator of a good definition (Kings, Moon and Case, 2014; Hair, Thatam and Black, 1999).

Items	Mean	TD	Asymmetry	Curtosis	K-S	Р	Communality
						Value	
60	3.819	1.001	770	.363	9.317	.000	.452
65	3.636	1.336	452	699	6.846	.000	.534
69	3.928	1.032	835	.260	8.415	.000	.537
70	3.985	1.038	945	.453	8.580	.000	.728
72	4.006	1.182	-1.083	.564	8.725	.000	.597
83	3.551	1.378	320	880	6.323	.000	.578
95	3.263	1.200	069	758	6.333	.000	.606
96	2.291	1.251	.597	361	7.476	.000	.740
97	2.551	1.234	.403	481	7.309	.000	.624
99	2.805	1.427	.190	832	6.334	.000	.550
101	3.118	1.103	002	542	8.162	.000	.575

Table 1: Descriptive analysis of the Items

TD: Typical deviation

K-S: Kolmogorov- Smirnov normality test

# **Table 2: AFE Solution**

Ítems	Factor 1	Factor 2	Factor 3
65. I trust in my aptitude to realize good research Works.	.723		
83. I trust in my aptitudes to defend my points of view with	.779		
regard to a subject-matter in study.			
95. I recognize my aptitudes to develop research processes.	.733		
101. I solve with facility research problems.	.500		
96. My friends say that the research excites me.		.922	
97. My partners look for me so that he explains research		.781	
topics to them.			
99. I motivate others to take part in research processes		.644	
60. I often leave aside the research activities.			.671
69. The research topics block me.			.721
70. The research readings produce discomfort to me.			.877
72. Investigating bores me.			.735



The Factor 1, remained shaped by four items which content they make it incline towards the exploration of the self-confidence in the execution of activities linked with the research since its contents determine capacity for: to solve problems, to realize research works, to defend points of view, to carry out research processes.

The second factor is structured by three items with orientation to the exploration of the promotion towards the research. The latent variable heads for the promotion and motivation of the research in its significant environment. Finally the third factor is faced towards the estimation of the interest in the research.

As an interest fact observed in these items a writing in inverse sense which is considered at the moment of the tabulation of the answers, but he does not exercise alteration in the composition of the results. The model factorial exploratory obtained is considered to be exact because.98 observed a high co-change

proportion between the items and the proposed model revealed by the index GFI =. Also a RMSR obtained =.0145 which was located below the criterion of Kelley's (.0277), element that ratifies the adjustment of the model to the sample estimated on having suggested low magnitude of residual that they stay without explaining with regard to the self-efficacy perceived for learning of the research.

With regard to the reliability there observes the presence of an alpha of Cronbach of.866 and a McDonald's Omega.864, both with one p value of.001. In an individual way, the factors presented an alpha of.822 for the factor 1;.857 for the factor 2 and.860 for the factor 3. The grades of the Cronbac's alpha and the Omega bear witness to high internal consistency and stability of the grades (Landeau, 2007; Bernal, 2006; Reynoso and Seligson, 2005). In this sense, the instrument has necessary that to throw coherent measurements of a measurement to the following one (Bernal, 2006).

Since it has been demonstrated, the self-efficacy for learning of the research meets linked the selfconfidence, from there that the feedback before positive experiences can encourage major personal safety on having faced learning of the research and on the contrary, before negative experiences it is more probable that it diminishes such safety. Nevertheless, the interpretation of the real experience acts like determinant of the evaluation of the same one.

Ε	lement-whole Static	tics			
Ítems	Averag e of the scale if the element is eliminated	Variance of the scale if the element is eliminated	Corrected interrelation element - whole	Cronbach's Alpha if the element is	
60	33.85	47.428	.402	.819	
65	34.03	44.231	.536	.808	
69	33.74	46.815	.429	.817	
70	33.69	46.517	.450	.815	
72	33.66	45.591	.479	.813	
83	34.12	43.920	.547	.807	
95	34.41	44.166	.580	.804	
96	35.38	44.945	.508	.810	
97	35.12	45.017	.507	.810	
99	34.87	43.784	.544	.807	
101	33.84	45.347	.451	.816	

Additional to it, the brought values are between the most recommended estimations, which range between 80 and 90 (Oviedo and Field, 2005). The interrelation item - whole corrected shows coefficients indicative.402 and 580 of a positive interrelation moderated between every item and with the whole less the item, which supposes that these reach port to the estimation of the variable (Mulberry trees, 2006). As for the interrelations between them it is had that between the factor 1 and 2 exists one r = .632, and between 1 and 3.435, who is considered to be a moderate. Between the factors 2 and 3 brings one r of .339, which is typified as it goes down. For the sake of establishing the stability of the model suggested in the AFE, one proceeded to realize the AFC which results suggest that the factors - dimensions identified reproduce the behavior of the population as for the self-efficacy for learning of the research it refers. In this sense it is considered that the model is as per statistics exact, which is demonstrated in the values showed in the table 4.

Whole	adjustment i	ndex	Increm	ental adjus	tment inde	x	Parsimony	$X^2/gl$	
GFI	RMSEA	RMR	CFI	NFI	GFI	AGFI	AIC	CAIC	
.977	.035	.042	.945	.916	.945	.961	156.228	322.904	2.621

**Table 4:** AFC Adjustment index

One of the elements that reinforce the comprehension of this tie is the power predictive of the selfconfidence in the functioning of the educational ambience like indicator of learning and yield. When the student presents personal safety he recognizes its fears, confronts the anxiety, one risks to experience potentially adverse situations, tolerates the frustration, makes use of the experiences of formation (Al-Hebaish, 2012; Hecimovich, Styles and Volet, 2014; Rabbit-breeders, Red and Segure, 2010). It is inferred that the yield in learning of the research is going to change in accordance with the grade of possession of the self-assurance and its capacities (Hecimovich et to., 2014).

The model factorial informed that the self-efficacy to learn to investigate turns out to be affected by the tendency that has the subject to promote the research processes. An self-effective individual is capable of persuading socially in favor of its domain area, from there that to the empowerment, shapes the condition and influences the motivation of others for approaching the research and facing him the fears, lacking in commitment, and interest absence in the development of this heuristic practice (Morgenshtern, Freymond, Hong, Adamowich and Mark, 2015). According to Lancu (2015), the promotion of the research is going to be proportional to the perception that the subject has of the real experience, as regards the confrontation of potentially frustrating situations. The effect of this action is straight proportional to the knowledge acquisition with utility contextual. This promotion aspect is going to be a key in the construction of the campaign to raise public awareness to investigate, the aptitude of risks to assume new knowledge and hence the promotion of a scientific culture (Saral and Reyhanlioğlu, 2015). The third and last factor refers to the interest in the processes of research, which the actions entrepreneurship affects in favor of the goals achievement, because he allows to arrange the cognitive and emotional resources in favor of the success (Ortega, 2014), from there that to increase it get ready of strategies that link the student with stages of applicability of the real experience in order that the probable results are inputs for the position of the ideas of efficacy tied to the research (Martyushev, Sinogina and Sheremetyeva, 2015). On having been constituted by cognitive and emotional elements, the interests allow the development of actions which feedback favors or inhibits the beliefs in the aptitudes to investigate, from there that this concept is key in the educational processes for its incidence in the knowledge construction, in spite of the transformations to which there turns out to be submitted the subject (Vasilescu, Moraru and Savab, 2015; Dubinina, Berestneva and Sviridov, 2015). The studies indicate that the interest of the students is linked to the research with the received motivation and simultaneously they involve the presence of the modeling of the teacher like agent participant in the process (Laleye, 2015; Lamanauskas and Augienė, 2015), which ratifies the coalition of external and internal factors in the construction of the self-efficacy to investigate.



### CONCLUSION

The inventory on the auto efficacy for learning of the research, is a scale with format type Likert shaped by three dimensions - factors that there explains 70,03 % of the variance associated with the construct in study. The dimensions that compose it are the following ones: self-confidence for learning of the research, promotion of the research, and interest in the research processes. The model factorial confirmatory is exact in accordance with the psychometric standards established. In accordance with the alpha of Cronbach of.866 and the McDonald's Omega.864, it is considered that the scale presents a high confidence index.

The exploration of this construct is constituted in an ally of the promotion of the university research in Spanish language populations. Revealing the internal functioning of the construct allows the relations development tutors who encourage growth experiences and at the same time they amalgamate the student with the research along its formation process in pre and postgraduate course. With this instrument, spaces are opened to explore situations of causality and dependence on the latent variables that act like empowering or inhibiting of the relation student - research minimizing to the maximum all possibility of experiencing adverse symptoms associated to "everything except research".

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# Integrating Interactive Whiteboard into the Teaching of Mathematics and the Academic Performance of Primary 4 Pupils in Ibeju-Lekki Lga of Lagos State, Nigeria

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### ABSTRACT

The study examined how interactive whiteboard (IWB) impact primary 4 pupils' academic and gender performances in Mathematics and compared between private and public schools' Mathematics performances using IWB as well. A total of 90 pupils from 327 pupils, aged 8-9 were selected as sample using pre-test, posttest non-randomized experimental and control group respectively. Using t-test statistics for data analysis, results showed that IWB positively impact pupils' Mathematics performance, no gender difference in academic performance of Mathematics' pupils using IWB and schools using IWB performed excellently in Mathematics than schools not using IWB. Recommendations were made based on findings.

Keywords: Interactive whiteboard (IWB), academic performance, gender, private school, public school

### INTRODUCTION

Most pupils lacking motivation often view Mathematics as quite difficult and one to be afraid. Tomlinson (2000:3) has it that "pupils in the Elementary grades vary greatly and teachers will have to attend to the differences if they want to maximize their individual potential... else, pupils may become confused, frustrated and unwilling to participate in the learning process." The implication of such learning experience often results in poor academic performance of pupils and could transcend into their next level of Education.

In reality, such experience has been the case in Nigeria over the past few years especially in Mathematics. According to the Head of West African Examinations Council (WAEC) National office in Lagos, Nigeria, Mr. Charles Eguridu, "a marginal decline in performance of candidates in 2014 WAEC examinations indicate a current trend of mass failure in Mathematics and English Language" as shown below:

Source: http://www.vanguardngr.com/2014/08/mass-failure-as-waec-releases-mayjune-exam-results/

Today, schools are increasingly using interactive white boards (IWBs) to enhance Mathematics instruction due to its great benefit from multiple representations and animations. In 2005, from a national survey in England, 49% of all primary school teachers and 77% of mathematics teachers in secondary schools use IWBs in their lessons respectively (Hodge, S. & Anderson, B. 2007).

Nevertheless, several views are held on enhancing learning with IWBs. From the development, one may ask: what is the enhancement potential of IWB integration to pupils' academic performance in Mathematics? Is there gender-related difference in academic performance of pupils taught Mathematics using IWB? Is there any difference between the academic performance of pupils in private and public primary schools taught Mathematics using IWB and those taught without using IWB? The following objectives were considered in the study:

• To find out what significant impact IWBs have on pupils' Mathematics performance.

Year	2012	2013	2014
Five credits (including Math and English Language)	38.81%	36.57%	31.28%



- To find out if gender difference exist in academic performance of pupils taught using IWB for Mathematics lessons.
- To find out if there is any difference in academic performance of pupils in Mathematics between private and public primary schools taught using IWB.

### INSTRUCTIONAL STRATEGIES AND ACADEMIC PERFORMANCE

Basically, we have "traditional" and "modern" instructional strategies. According to Yusuf, (2004), the traditional method of learning using blackboard, chalk, slates, stones, and so on is a practice still common in most Nigerian schools regardless of students with different learning abilities. Gambari, (2010) believed that such approach is a major factor in poor academic performance. Other instructional strategies for teaching include technology application, software and so on (Boni, 2007). Liao (2007) concluded that computer-assisted instruction (like IWB) had a positive effect on students' performance than traditional instruction. He found that different instructional approaches were used in computer-assisted instruction, there are more improved levels of academic performance. Again, it showed that high ability students' performance is recorded with modern instructional tools as against the traditional strategy. These results were not only seen in Taiwan, but also in the United States.

Suzanna, S. (2011) began to investigate instructional strategy of differentiated instruction and how Howard Gardner's theory of multiple intelligences (MI) could assist teachers to accommodate the learning needs of all students and differentiate instruction resulting in greater academic performance in elementary grades K-6, hence, the use of IWB. Again, a report on interactive whiteboards from London's Institute of Education said statistical analysis showed no impact on pupil performance in the first year in which departments were fully equipped (Kurbel, 2001: 133-136). Aytac T. (2013) observed 202 students' views in primary and high schools in Ankara, on problems faced during IWB use, gender difference and duration of IWB use via t-test and one-way ANOVA where no significant differences were found in terms of gender performance and IWB use but a clear difference between primary school and high school students' views about the use of IWB was shown. Also, it observed that students had a positive attitude towards IWB use. Also, Armstrong et al., (2005) argued: 'to date, no absolute properties of an IWB have been identified that would allow one to predict the effects they have on teaching, and the use of IWBs alone cannot lead to enhanced teaching.' One of the most compelling studies that showed a negligible effect of IWB on academic performance is Higgins et al. (2007). No significant difference was found in test scores between schools using IWBs, and schools not using IWBs after a 2 year study. Christophy & Wattson (2007), in a comparative study showed that a group of high school students who learned abstract terms in chemistry using IWB actually received lower scores on a multiple choice test of knowledge in comparison to the group that learned traditionally (without the IWB). Similarly, Schuck & Kearney (2007) claimed that little or no difference was found in the national test scores in mathematics and science in UK primary schools between IWB and non-IWB classrooms.

Based on a study conducted by the London Institute of Education with the funding of the DfES to evaluate "the Schools Whiteboard Expansion project", Somekh, B. (2007) opined that interactive whiteboards associated with little significant impact on student performance in Mathematics and English and only a slight improvement Science at Key Stage 3, while in the same schools, the use of interactive whiteboards was found to have negative effects for Mathematics and Science, but positive effects for English at Key Stage 4. The authors cite several possible causes the Key Stage 4 findings which for include: According to https://en.wikipedia.org/wiki/Interactive\_whiteboard, "a Type II statistical error, disruption to teaching methods leading to reduced pupil performance when IWBs were installed."



### GENDER AND ACADEMIC PERFORMANCE

Previous studies are of divergent views on gender and academic performance. While some claim that there is no significant gender difference among academic scores, others conclude that girls do better in school than boys vice versa. Ifamuyiwa & Akinsola (2008), Annetta, et. al. (2009), reported that gender has no effect on academic performance of students in physics and mathematics respectively. Mlambo, V. (2011) designed a study to identify and analyze some determinants of academic performance in an introductory biochemistry (AGRI 1013) course plagued by chronic high failure rates in a first year programme at the University of the West Indies, St. Augustine campus. Using a random sample of 66 registered students (representing a 40% sampling fraction) to generate data on demographics (gender and age), the author added that though learning preference, entry qualifications and their effects, gender, and age were determined on academic performance, none of those factors significantly impacted academic performance (Mlambo, V. 2011).

### SCHOOL TYPE AND ACADEMIC PERFORMANCE

Akinyele, G.A., et. al. (2008), investigated the influence of school type, population of school and socioeconomic status of parents on secondary students and their academic performance. Three hypotheses were postulated and tested at 0.05 level of significance using 680 students of public and private secondary schools in Akinyele L.G.A. of Oyo State, Nigeria selected through a simple random technique between the age ranges of 14-18 years with a mean age of 15.7 years. Result of data analysis using zero-order correlation and t-test statistical procedure indicated that the parental SES, school type, school population and general school environment can make a significant contribution to students' academic performance. Eshetu, A. (2015) carried out a Comparative Study of Private and Government Schools in Dessie Administrative Town, North Central Ethiopia using ANOVA to dissect mean differences based on school services satisfaction level and Chi-square test to establish relationships between school types with facilities and activities. The t-test results revealed that private schools have scored statistically better than government ones.

### **RESEARCH DESIGN AND DATA ANALYSIS**

The study used a pre-test, post-test non-randomized experimental group (private school) and a control group (public school). Participants in the study were from three Elementary Four classes with similar ability and makeup. The first group: Awoyaya Primary School (control group) was observed using traditional teaching method (black board) while the second group: Corona School and Greensprings School (experimental groups) used IWB/ whiteboard to teach Mathematics respectively. A purposive sampling without replacement was adopted. A total of 90 pupils, aged 8-9, from control group and experimental groups were selected as sample from a target population of 327 Elementary primary 4 pupils in all the schools observed.



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Data Analysis





### **Result Presentation**

T	able 1:	<u>T-T</u>	EST RE	SULT F	FOR EXI	PERI	MENTAL GR	OUP USIN	G IWI	<u>B</u>	
		Pre-	Post-	Diff.	Mean	Ν	Std. Dev.	Std.	Df.	t <sub>critical</sub>	tcalculated
		Т	Т				(SD)	Error			
								Mean			
								(S <sub>đ</sub> )			
	Experimental group (E)	4,258	4,413	155	3.44	45	4.09	0.61	44	1.68	5.64

# FOULT FOR EXPERIMENTAL CROUPLIGNIC

From the result shown in Table 1 above, the tabulated value ( $t_{critical}$ ) = 1.68 while the calculated value ( $t_{calculated}$ ) = 5.64; indicating a significant difference in academic performance of pupils' Mathematics using interactive whiteboard.

Decision: Since the critical value is lower than the calculated value, we reject the null hypothesis (H1<sub>0</sub>) and accept the alternative hypothesis (H1<sub>1</sub>).

#### T-TEST RESULT OF GENDER PERFORMANCE BY EXPERIMENTAL GROUP Table 2: USING IWB

	Diff	Mean	Ν	Std. Dev.	Std. Error Mean $(S_d)$	Df	t <sub>critical</sub>	t <sub>calculated</sub>
	•			(SD)		•		
<b>T</b> · · · 1	1.4.4	2.2	4	10.1	1.04	40	2.02	0.60
Experimental group	144	3.2	4	12.1	1.04	43	2.02	0.68
(E)			5					

From the result shown in Table 2 above, the tabulated value  $(t_{critical}) = 0.68$  while the calculated value  $(t_{calculated}) =$ 2.02; indicating no gender difference in pupils' Mathematics performance using IWB.

Decision: Since the table value is greater than the calculated value, we accept the null hypothesis  $(H2_0)$  and reject the alternative hypothesis  $(H2_1)$ .

Table 3: T-TEST RESULT OF PRIVATE AND PUBLIC SCHOOL'S PERFORMANCE USING I	IWB
---	-----

	Diff.	Mean	N	Std. Dev. (SD)	Std. Error Mean (S <sub>d</sub> )	Df.	t <sub>critical</sub>	t <sub>calculated</sub>
Experimental group (E)	289	6.43	45	17.1	1.17	43	2.02	13.44

From the result shown in Table 3 above, the tabulated value ( $t_{critical}$ ) = 2.02 while the calculated value ( $t_{calculated}$ ) = 13.44; indicating a significant difference in academic performance of pupils' Mathematics between private and public schools using interactive whiteboard.

Decision: Since the table value is lower than the calculated value, we reject the null hypothesis  $(H3_0)$  and accept the alternative hypothesis (H3<sub>1</sub>).

# SUMMARY OF MAJOR FINDINGS

Statistically speaking, the following served as major findings of the study:

- IWB integration does impact pupils' Primary 4 Mathematics performance.
- There is no significant difference in pupils' Mathematics performance between male and female using IWB for lessons. The experimental group recorded 100% scores by both gender during the post survey test in both Corona School and Greensprings School respectively where IWBs were used.



• There is a significant difference in pupils' Mathematics performance between private and public Primary schools using IWBs to teach Mathematics.

# IMPLICATIONS OF THE STUDY

In reference to the study, the following implications were deduced:

- That IWBs usage enhance pupils' grasp of basic Mathematics concepts in schools.
- IWB integration into Mathematics was a right step in a right direction to curb a growing trend of poor performance among pupils.
- As an instructional tool, IWB guarantee and promotes effective teaching and learning as well as academic excellence in primary schools.
- Different learning needs, personalized performance benchmark, active learning behavior and motivation are reflective of IWB integration; leading to mastery of basic Mathematical concepts.
- Regardless of gender or school type where IWB are used, basic Mathematics concepts are easily grasped.
- More public and private schools integrating IWB into teaching Mathematics will yield large turnout of excellent academic performances especially at the Elementary level.
- A solid Mathematics foundation established via IWB integration in teaching aids pupils' in excellent academic performance beyond the Elementary level.

# RECOMMENDATIONS

Recommendations made based on the discussion and research findings of the study were as follows:

- Public and private primary schools are encouraged to use IWB to teach Mathematics.
- Government, Administrators and other organizations should provide IWB to schools.
- Adequate teachers' training on use of IWB be provided.
- Teachers are encouraged to share their thoughts on IWB integration.
- Schools with excellent academic performance record in pupils' Mathematics should be recognized and motivated by government, NGOs, corporate and private organizations periodically.

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# Integration of Process and Product Aproaches in English Classes at Cotopaxi Technical University

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# RESUMEN

El objetivo principal de esta investigación cualitativa fue determinar la influencia de la aplicación de un enfoque de método dual, la integración de los enfoques del proceso de escritura y el enfoque denominado producto en el desarrollo de la habilidad de escritura de los estudiantes como lengua extranjera. El estudio se llevó a cabo en la Universidad Técnica de Cotopaxi durante el período académico de abrilagosto de 2017. Después de un análisis crítico de las características, los beneficios y desventajas de los dos enfoques antes mencionados, se llevó a cabo una implementación pedagógica en los estudiantes de A1 en las clases de inglés, con 11 estudiantes. Se utilizaron como instrumentos de recopilación de datos las rúbricas, las composiciones escritas de los estudiantes y la corrección de los profesores. Los resultados muestran que la integración de los dos enfoques son adecuados para desarrollar la habilidad de escritura en el nivel A1. Las composiciones escritas de los estudiantes, desarrollados utilizando con el proceso y el producto como enfoques son significativas para guiar el desarrollo de la escritura. Por lo tanto, se sugiere que los maestros implementen un enfoque de método dual en el que comiencen a enseñar la escritura utilizando el enfoque de proceso de escritura para ayudar a los estudiantes a generar ideas y a comenzar a escribir combinado con el enfoque de producto para desarrollar competencias lingüísticas en sus composiciones de escritura. Esta combinación mejora la habilidad de escritura de los estudiantes y la calidad de escritura también. Mientras que el primer enfoque ayuda a los estudiantes a generar ideas y organizar esas ideas en una composición de texto, el segundo ayuda a expandir su estilo de escritura. Palabras claves: enfoque del proceso de escritura, enfoque de producto, estudiantes de lengua extranjera, desarrollo de la habilidad de escritura

# ABSTRACT

The main aim of this qualitative research was to determine the influence of applying a dual method approach, integration of process and product approaches, in the development of EFL students' writing skill. The study was carried out at Technical University of Cotopaxi, during the academic term April - August 2017. After a critical analysis of the characteristics, the benefits and the drawbacks of the two approaches mentioned before, a pedagogical implementation was carried out in A1 English classes, with 11students. Rubrics, student's written compositions and teachers' correction were used as data collection instruments. Results show that the integration of the two approaches are suitable to enhance writing skill in A1 level students. Students' written compositions developed with the process and the product approaches are more meaningful to guide the development of writing skill. Therefore, it is suggested that teachers implement a dual-method approach in which they start teaching writing using the process approach to help students learn how to generate ideas and begin their writing combining with the product approach in order to develop linguistics competences in their writing compositions.



This combination enhances students' writing skill and the quality as well. While the first approach helps students to generate ideas and to organize those ideas into a text composition, the second one helps to acquire linguistic knowledge and expand their writing style.

Keywords: process approach, product approach, EFL students, enhance writing skill

### **INTRODUCTION**

The development of the writing skill must result in the ability to create logical and coherent compositions to convey information, ideas, feelings and messages. Regardless of whether the composition is a brief memo or a long drawn out research analysis, teachers should help students to write quality-writing compositions with the purpose of communicating effectively. The literature reviewed the analysis of the benefits and drawbacks of each approach allow us as researchers and education professionals to understand the importance to know when to apply the process approach and when to apply the product approach to ensure that students develop long-lasting and strong writing skill.

At the Language Center of Cotopaxi Technical University, we have begun to implement the dualapproach method to ensure that EFL students hone two important and specific skills: the former being the generation of original ideas; and the latter being the organization of those ideas into fully developed compositional texts. These steps are essential because when EFL students face a writing activity, they tend not to know what to write or how to express the ideas that they do have in a logical sequence. Thus, teachers should support EFL students with extensive practice and feedback in class as well as at home. Regarding this, many teachers ask themselves how to help their students to reach the point at which they are able to compose various works with complete accuracy. The answer is simple: teachers should apply an integration of the process writing approach and the product approach to help students be aware about the stages adequately and provide them success in writing. Pre-writing activities lead EFL students to come up with ideas and organize them creatively, providing them with confidence as they start writing (Shorofat, 2007). In addition, it is important to make students familiarize and practice controlled, guided and free writing activities to give students a general idea about the linguistic knowledge.

Once EFL students are able to generate and organize their thoughts, they may begin to create their first drafts, in which teachers must guide them throughout feedback in order to polish and perfect their composition as much as they need. It is here where teachers must act as guiders of grammar, spelling, punctuation and vocabulary to make clear and quality compositions. Additionally, when EFL students are exposed to writing process activities, the students' progress in writing skill acquisition becomes obvious. The next crucial component by the end of the process EFL students will be more aware of their ability to write and their confidence in themselves as their writing skills will be much stronger.

According to our experience at the Language Center, the expansion of writing ability with the help of different texts is relatively simple at this point because EFL students have already learned how to develop their own ideas and they must only organize those ideas with the provided format. At this process, teachers should focus on revising linguistic knowledge, but with the purpose of conveying clear meaning and expression.

Oczkus (2007) contends, "modeling writing alone is not sufficient to produce effective writers; it also need to generate ideas and organize them" (p.27). It is clear that giving students the words, the structures, and the models of the text is not enough to effectively enhance writing. It is paramount that teachers provide students with both approaches in tandem in order that students can be able to produce appropriate linguistic knowledge, appropriate structure and outlines to eventually become independent writers.

It is important to help teachers learn the stages of the process writing approach and the product approach as alternatives to develop writing skill so that they can guide students in developing writing skill. There are 5 stages of the writing process (Tomkins, 2004). • **Prewriting:** It is a planning stage for writing that permit students to generate ideas and organize them. Teachers can use brainstorming, mind mapping or graphical organizer to come up with ideas and organize them. It is a crucial stage that students must be familiarized in order to start writing.

• **Drafting**: In the draft stage, students are expected to write the ideas into paragraphs on a piece of paper. The main activity is to organize the content.

• **Revising**: This stage consists of the students' review of the written draft, sharing the draft text with a writing group that was formed in the classroom, and rearranging the content according to feedback from friends in the writing group. In this stage, the students might expand the text with new ideas or remove the parts that they think unnecessary.

• Editing: The content s check by the teacher and in this stage spelling rules and punctuation, which are called the mechanical aspect of writing, are checked.

• **Publishing:** This is the last stage of the writing process. In this stage, the students publish their writing task making other students read it. It is necessary that teacher guide all the process to have good results in their writing ability.

Badger and White (2000) mention that there are four specific stages in the product approach to follow when producing writing compositions (p.153).

- **Familiarization** aims to make learners aware of certain features of a particular text. At this stage, the model compositions are given to learners to focus on grammar that teachers want to teach.
- **Controlled writing** is where learners practice new language in a limited way. They rehearse grammar or vocabulary by completing exercises or writing sentences in an isolated way. It requires only the manipulation of the language learned.

Guided writing is the next stage in the product approach. The aim of the guided writing is that students can write compositional texts using the language previously taught.

• **Free writing** is a stage where students are motivated to write a letter, story or essay on their own, but using the language that was taught before. Writing freely does not mean that students develop writing skills they are still dependent on teachers.

These stages will help teachers to follow and guide the writing activities and students to develop writing skill and be motivated to produce writing.

That is why the objective of this research was to determine the influence of applying an integration of the process approach and the product approach in English classes to develop EFL students' writing skill.

# METHODOLOGY

The main aim of this research was to determine the influence of applying the process and product approaches to enhancing ELF students' writing skill. An action research was carried out with a group of 11 beginning students (A1 level) of the Language Cultural Center at Cotopaxi Technical University in Ecuador, during the academic term April-August 2017. The study involved six phases.

a) The Problem Identification Phase. – In this phase, the researchers analyzed the problems that the students had when writing a writing composition. The main problem was students' poor writing skill. Student's had difficulty in completing a writing assignment because they did not know to how to start the writing activity because they had complications to generate ideas and the organization of those ideas. It was analyzed the causes and the effects taking into account literature review and the teachers' experience. This inquiry allowed identifying that students' and teachers did not apply an approach to help students guide their writing process in classes.



b) The Diagnosis Phase. – The researchers applied a pretest during this phase. It consisted of assessing a writing composition in classes. This diagnosis was conducted in beginner English students level "A1." The writing composition was graded by using a writing rubric that was adapted from Rcampus (2017) and it was taking into account the descriptors of standards developed by the Council of Europe (2001) in the Common European Framework for the Basic A1 level.

Writing		Organization	Grammar	Spelling	Punctuation	Vocabulary	Outline
Criteria	Ideas						

c)

- d) The Planning Phase. The process begun in May when the researchers started to identify and formulated the problem that student had related to writing. Then, the researchers review relevant information about the two approaches to help students guide their writing. Students participated in this study voluntarily. First, the researchers discussed the purpose of the study with the students, and their role in the study. Then, the activity started as part of their learning process
- The Action Phase. Once the researchers identify the process and product approach as an alternative to e) develop writing skill in beginner English students level A1 at Cotopaxi Technical University, the researchers put into practice the proposal of "a dual method approach, combination of the process and product approaches to students. These writing activities were done according to the unit topics from the "Speed up Book". The researcher's role was to present systematically the strategies beginning with the ones Tangpermpoon (2008) suggests to generate ideas such as brainstorming and mind mapping, etc. During the process, the researcher followed the 5 steps to guide the writing process. The researcher also focused on structuring to select the most suitable ideas for the first drafting. Then, the researcher and the students discussed the order of the ideas. Peer-feedback, editing, teacher's feedback and permanently evaluation were other important facts that the researcher developed during this learning process. Once the students are aware of the writing process, it was time to teach them how to write an e-mail. It was used the product approach because we use a model of an e-mail and some specific structures to write in it as Badger and White (2000) suggested. All writing compositions were done in classes with all the process until to get the final product. The students' role were to follow the steps and do extra practice as homework at home, selecting similar topics as we have practiced in classes.
- f) The evaluation phase. A post-test was applied in order to evaluate the pedagogical implementation. It was graded an e-mail based on students 'experience on vacation. The writing composition was graded using a writing rubric, which was adapted from Rcampus (2017), and it was taking into account the descriptors of standards developed by the Council of Europe (2001) in the Common European Framework for the Basic A1 level. The evaluators were two teachers with wide experience in teaching English from the Language Center at Cotopaxi Technical University.
- g) The Reflection phase. The researcher analyzed the gathered data from the collection of the pretest and the posttest (final products). The teacher's role was as a guide and facilitator to develop students' writing skill during all the process. The main result will be presented in the following section.

### RESULTS

After the pedagogical implementation, using the process approach and the product approach, all students have improved significantly their writing compositions in the components: ideas, organization, grammar, spelling, punctuation, vocabulary and the e-mail format. They are shown in the following results. Chart 1: Descriptive Statistics: Results of the Pretest and the Posttest in writing compositions



Average	2,09	2,18	2,64	2,64	2,00	2,55	2,00
score in the							
Pre-test (over							
5 points)							
Average	3,95	3,95	3,95	3,95	3,95	4,10	3,70
score in the							
Post-test							
(over 5							
points)							
Improvement	1,86	1,77	1,31	1,31	1,95	1,55	1,70

The results showed that the application of the process approach and then the product approach contributed positively in the improvement of writing skill. In the component, 'ideas' there was an improvement of 1, 86 marks. In the component 'organization' 1, 77, in grammar and spelling 1, 31, in punctuation 1, 95 marks. In vocabulary 1, 55 and e-mail format 1, 70. It is worth mentioning that the improvement was more in the component of ideas and organization. These aspects were more emphasized in teaching writing as part of the process approach. There was also a high improvement in punctuation, which is part of the product approach. The components of grammar and spelling improved, but not as the rest of the components.

### DISCUSSION

The researchers proved that the use of the process approach and then the product approach contributed positively to enhance writing skill in EFL students at Cotopaxi Technical University. The comparison of the average score achieved using the pretest and the posttest determined the improvement that students have had in all the writing components (ideas, organization, grammar, spelling, punctuation, vocabulary and the outline during the pedagogical application. As the same investigation of Cavkaytar & Yasar (2010), states that the explanation of the writing process stages and modeling as product approach contributed greatly to the students' writing effectively.

The teacher started teaching students prewriting. The teacher modeled brainstorming and planning structure on the board about personal information and then it was asked students to practice with a member of their family. It was also used some pictures to help them think and come up with ideas. All of these permitted that students can be conscious of the process to start writing. Then the teacher taught them how to organize those ideas. The teachers asked them to number the ideas according to the importance and sequence. It really contributed to analyze with the students the order of the ideas to write into a paragraph. The students showed a positive attitude towards these activities because they were not so long. Related to this topic, Ariza (2005) proved that brainstorming really help students to generate ideas and that using pictures was the best technique. In our study, we use pictures to develop creativity in their writing. These steps are crucial in developing writing skill as many researchers mentioned.

Another improvement was in grammar, spelling and punctuation where the teacher's role was indispensable to develop these components. They were taught using the product approach. The teacher made students to familiarize with the structures and vocabulary of the provided texts. Then students had to produce some sentences related to the topic (controlled writing). These sentences were just a list of examples that were not formed into a formal paragraph to explain main ideas. Then, they moved to the guided stage to construct a piece of writing based on a picture related to the topic. At the free writing stage, the students described their own topic. These helped to develop the use of grammar spelling and punctuation, but they were just some list of sentences, which later contributed to write paragraphs and small compositions according to their level.

At this stage, they had a general vision about the use of grammar, spelling and punctuation. After students learned about grammar spelling and punctuation at the same time, it was appropriate to start writing and improve these components in a writing composition. Regarding this, Chin (2000) states that effective grammar instruction begins with what students already know about grammar and it helps them use this knowledge as they write.

As students revised and edited through peer-feedback and teacher's feedback, they improved their language usage and then they writing skill. The teacher used peer- feedback, asking students to check for organization, grammar, spelling, punctuation, and circle where students have to check again.

Therefore, when they had their writing compositions back, they asked the teacher why the problem was. It was time for teacher's feedback. The teacher explained the common mistakes to the whole class so they can correct them. This process really helped develop the three components and writing skill. Regarding this, the investigation of Ashok (2012) strongly recommends that the teaching of writing could be successful when we teach using peer correction followed by teacher correction. The teacher acting as a facilitator in peer-feedback and teacher's feedback contributed to improve their writing skill positively and to acquire grammar, spelling and punctuation through real writing compositions. In the same context Correa, Martinez, Silva & Torres (2003) demonstrated that positive feedback contributed that students improved their pieces of writing in the following categories: content: improvement of ideas, grammar and spelling. Also, many researchers suggested that punctuation and grammar should be checked as an end of the process, not as final process because they are not the purpose of written communication, but they are important as part of the means of communicating a message.

Another important component that was improved was vocabulary. Students did not have problems to use vocabulary according to the topics when writing their compositions. To develop vocabulary it was used the product approach steps (Familiarization, controlled writing, guided writing and free writing. These steps helped students practice writing exercises, which goes from simple sentences to complex sentences. These activities permitted to develop vocabulary and paragraphs to enhance writing skills. Regarding this, Barrantes & Olivares (2010) in their investigation showed that applying techniques (Starting to Think, An Interesting Inventory, Writing TS, Writing Supporting Sentences, Let's Assess, along with Fun with Grammar) contributed to practice vocabulary and develop paragraphs, which are essential to enhance writing skills. The techniques mentioned above are related to the steps of the product approach that many researchers used to develop vocabulary through repeated exposures in various writing activities. However, the investigation of Pigada & Schmitt (2006) indicated that more vocabulary acquisition is possible from extensive reading.

Once students knew all the writing process, they wrote an e- mail using just the modelling text to complete the writing task. The needed to learn specific structures related to the outline of the e-mail. It was easier because they simply copy the structures already established for the outline. For the body of the e-mail, the students apply the process approach that they have learned before. It is clear that is important to use both the process approach and the product approach to enhance writing and expand their writing style.

We had some difficulties in students' time to study English; they had lost of activities to do in their careers so their time is limited to practice English that is why little writing activities were sent at home. Another trouble was at the moment to evaluate the students writing compositions. Teachers focus so much in grammar and spelling and they sometimes do not focus on the rubric presented. They evaluated according to their perception, it is two or three errors, and it is not a good writing. Teachers focuses so much in grammar, spelling when giving a score to the writing compositions even though the errors do not interfere in the message. Teachers want a writing composition without errors and that is why those components were the lowest in the improvement.

It is essential to change teacher's perception about writing, the teaching and the evaluation to make students feel that they are doing well in their writing activities otherwise they will be frustrated to write.

### CONCLUSIONS

The results show that the integration of the writing process approach and the product approach in EFL students A1 level language at Cotopaxi Technical University are effective in developing writing skill. This integration permits that students can learn by practicing and modelling in order to fulfill writing activities inside and outside classes, according to their level. Brainstorming, planning structure, editing revising are the key to be successful in writing because students know how to start and complete writing assignments in English classes at Cotopaxi Technical University.



WRITING	EXCELLENT	GOOD	FAIR	POOR	SCORE	SCORE
CRITERIA	5	4	3	2	before	after
IDEAS	All the ideas were	Ideas were expressed	The ideas	The ideas were		
	expressed effectively	in a pretty clear	were	not clear and it		
	and describes the	manner and the	somewhat	does not		
	nurnose message	message content was	clear and the	describe the		
	purpose message	understood (nisture		massage		
	(nisture description)	description)		message		
	(picture description)	description)	content was	content		
			difficult to	(picture		
			understand	description)		
			(picture			
			description)			
ORGANIZATI	Clear and logical	Logical organization	Some	Limited		
ON	organization of	of content	evidence of	evidence of a		
	content		organization	logical		
			content	organization		
				content		
GRAMMAR	Contains a maximum	Contains more than 3	There are	There are lots		
	of 3 grammar	grammar mistakes,	some grammar	of grammar		
	mistakes which do not	however, they do not	mistakes that	mistakes that		
	really interfere	really interfere in	interfere with	really interfere		
	in understanding the	understanding the	meaning most	with meaning.		
	message.	message.	of the time.			
SPELLING	A maximum of three	More than three	Spelling	Too many		
	spelling mistakes	spelling mistakes,	mistakes	spelling		
	which do not obscure	however, they do not	makes a little	mistakes that		
	the meaning of the	obscure the meaning	difficult to	makes it		
	word.	of the word.	understand the	difficult to		
			message.	understand the		
			U	message.		
PUNCTUATIO	A maximum of two	More than two	Lack of	There is no		
Ν	punctuation mistakes	punctuation mistakes	punctuation	punctuation		
	or omissions which do	or omissions, however.	makes the	which makes		
	not interfere with the	they do not interfere	message quite	the message		
	meaning.	much in the meaning	confusing	confusing.		
VOCABULARY	Vocabulary is used	Few errors in the use	Inappropriate	Inapropriacies		
	appropriately most of	of the appropriate	use of	in vocabularv		
	the time.	vocabulary. However	vocabulary.	use which		
		they do not interfere in	however, they	interferes with		
		conveying the	do not	message		
		message	interfere much	conveying		
		mobugo.	in conveying	conveying.		
			the message			
TOTAL SCODE			uie message.			
I UIAL SUUKE						
	1	1		1	1	



Also, familiarization, controlled writing, guided writing and free writing contribute as part of the product approach to have a general idea about mechanics( vocabulary, grammar, spelling and punctuation),but peer-feedback and teacher'sfeedback help students at Cotopaxi Technical University to internalize this learning and improved the way they have to be used in a writing task. Modelling is another crucial aspect that contributes to expand students' writing styles. It is easier to followed specific structures as an outline of the e-mail. This process allows EFL students at Cotopaxi Technical University to be confident, motivated when they start writing. Working using a balanced integration of the writing process approach and the product approach, teachers will have better results in enhancing writing skills and improving EFL students ' motivation to continue scaffolding this skill.

# **Appendix 1. Scoring Rubric**

# WRITING RUBRIC

**Objective:** To evaluate students' ability to write short compositions on a given topic. Student's name: \_\_\_\_\_\_ Evaluator:

Title: Date:

Source: Adapted from Rcampus (2017)

### Appendix 1. E-mail rubric

**Objective:** To evaluate students' ability to write an e-mail to a friend on a given topic

WRITING	EXCELLENT	GOOD	FAIR	POOR	SCORE	SCORE
CRITERIA	5	4	3	2	before	after
GREETINGS AND	The student uses	The salutation and the	The salutation	There is no		
PURPOSE OF	an appropriate	purpose of the writing	has a mistake	salutation and		
WRITING	salutation and	is clear	with names	purpose of		
*******	write the purpose		and the	writing		
	of the writing		structure to			
	of the winning		write the			
			nurpose of the			
			writing is not			
			clear			
IDEAS	All the ideas were	Ideas were expressed	The ideas	The ideas were		
	expressed	in a pretty clear	were	not clear and it		
	effectively and	manner and the	somewhat	does not		
	describes the	massage content was	somewhat	does not		
		understood (last		massage		
	purpose message	understood (last	message	inessage		
	content	vacation)	content was	content (last		
	accurately (last		difficult to	vacation)		
	vacation)		understand			
	~		(last vacation)			
ORGANIZATION	Clear and logical	Logical organization	Some	Limited		
	organization of	of content	evidence of	evidence of a		
	content		organization	logical		
			content	organization		
				content		
GRAMMAR	Contains a	Contains more than 3	There are	There are lots		
Past tense	maximum of 3	grammar mistakes,	some grammar	of grammar		
	grammar	however, they do not	mistakes that	mistakes that		
	mistakes which	really interfere in	interfere with	really interfere		


	do not really	understanding the	meaning most	with meaning.	
	interfere	message.	of the time.	0	
	in understanding				
	the message.				
SPELLING	A maximum of	More than three	Spelling	Too many	
	three spelling	spelling mistakes,	mistakes	spelling	
	mistakes which	however, they do not	makes a little	mistakes that	
	do not obscure	obscure the meaning	difficult to	makes it	
	the meaning of	of the word.	understand the	difficult to	
	the word.		message.	understand the	
			_	message.	
PUNCTUATION	A maximum of	More than two	Lack of	There is no	
	two punctuation	punctuation mistakes	punctuation	punctuation	
	mistakes or	or omissions, however,	makes the	which makes	
	omissions which	they do not interfere	message quite	the message	
	do not interfere	much in the meaning.	confusing	confusing.	
	with the				
	meaning.				
VOCABULARY	Vocabulary is	Few errors in the use	Inappropriate	Inapropriacies	
	used	of the appropriate	use of	in vocabulary	
	appropriately	vocabulary. However,	vocabulary,	use which	
	most of the time.	they do not interfere in	however, they	interferes with	
		conveying the	do not	message	
		message.	interfere much	conveying.	
			in conveying		
			the message.		
CLOSING AND	The e-mail	The e-mail contains	The e-mail	There is no	
SIGNATURE	contains	phases according to	contains not	closing and	
	appropriate	their level for the	so good	signature part	
	phases according	closing and signature	appropriate	in the e-mail	
	to their level for	part	phases for the		
	the closing and		closing and		
	signature part		signature part		
TOTAL SCORE					

### Source: Adapted from Rcampus (2017)

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# **Interpersonal Relationships and School Quality**

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# ABSTRACT

Studying interpersonal relationships in a school provides a significant contribution to an understanding of the quality of the school, because its quality may be considered through the sum total of all the inter-personal relationships within the school as an institution. Educational practice is increasingly taking notice of the problems in interpersonal relationships which arise within a school. The teaching relationship fundamentally takes place between the student and the teacher, but relationships within the school go beyond the framework of that relationship. Therefore, in this study four key relationship dimensions are identified: the relationship between parents and teachers; the relationships between students; relationships between students and teachers; and relationships between teachers. The order in which these relationships are listed does not express the criterion of the importance of these relationships for the quality of the school, but rather the quantitative criterion of the accessibility of scientific research and insights into its results. The relationships that have been researched most are the parent-teacher relationship, and relationships between students. The relationships between students and teachers has been somewhat neglected, and in the opinion of the authors, it is the most complex of these relationships. The relationships between teachers are the least researched. The relationship between parents and teachers may be traditional or contemporary, and it positions the subjects in terms of superiority and inferiority. The relationship between students is considered through peer relationships, in terms of popularity and friendship. The relationship between students and teachers is considered within the framework of attachment theory. The relationships between students express different dimensions which we could summarize as two dimensions of positive relationships (collegiality and intimacy) and two dimensions of negative relationships (disengagement and frustration).

Keywords: relationships in school, school quality, students, teachers, parents

#### **INTRODUCTION**

Relationships in education are a major challenge for both scientists and practitioners, and are a subject of interest for studies in school pedagogy. Educational practice is increasingly taking notice of problems in relationships between students, between students and teachers, between teachers and parents, as well as between teachers working in the same school. People have a need for contact and they express and experience their own personality in relationships. People are built up by making contact with other people. It is possible to consider a relationship in terms of: I-I, I-you, I-another. Relationships in a school within the I, you and another dimensions are linked with the emotional reactions of each of these subjects. Emotional reactions that we could define as positive or, according to some authors, "pleasant" (Milivojević, 2008) contribute considerably to the quality of a relationship. If we include in this consideration the dimension of intimacy, we can distinguish the relationship patterns of optimality, adequacy, neglect, distancing and confusion (Potom, Lynch and Cicchetti, 1997; according to Siranović, 2016). Problematic interpersonal relationship patterns which reflect on the quality of the school are patterns that lack positive or pleasant emotional reactions, seen in neglected and distancing relationships. Researching interpersonal relationships in a school begins by researching the atmosphere of the school and the quality of the school. Some research into the atmosphere of schools indicates the connection between the quality of relationships in the school and the quality and/or effectiveness of the school (Tarter, Hoy, 1988). An indicator of this connection are the feelings of confidence in the interpersonal relationships between teachers, job satisfaction, inclusion in the life of the school (Domović, 2004). As an indicator of the quality of the school we also see the positioning of students within the school hierarchy, where in a humane school students are not positioned or defined merely as a role, but also as developing persons. The didactic and methodological concept of such schools shows their paedo-centric determinants, and learner centred education. The results of research indicate that one of the most important prerequisites for the quality of a school is the personality of the teachers and the teaching relationship between the teacher and the students (Bašić, 2015).



Regardless of the fact that the pedagogic relationship fundamentally takes place between the educators and those being educated, schools abound in relationships which go beyond the bounds of this relationship. We have found four key relationships in schools to be extremely important and significant, and worthy of careful observation. These are:

- relationships between parents and teachers
- relationships between students
- relationships between students and teachers
- relationships between teachers.

#### **Relationships between parents and teachers**

By comparing the relationships between parents and their child, and between parents and teachers, we can see similarities. The relationship between the parent and the teacher depends on the relationship between the parent and child, and their attitudes. Jones and Ignelzi (2000) analysed the relationship between parents and teachers, and differentiated them in relation to the beginning and the end of the child's education. At the beginning of education, the parents carefully monitor their child's development and success; expectations are great and they are disappointed by their first failures. Great demands are placed on teachers; they must be good, patient, fair towards the child... At first parents take up a slightly competitive stance towards the school. In school the child encounters a new authority - the teacher, whom the parents, more on an unconscious level, begin to see as a rival. Parents begin to feel abandoned, sadness arises for the time when all the child's needs were met within the family. Parents experience the beginning of the child's education as a separation, the beginning of the child's individualization, which is a blow to the previous balance in the family. This is the reason for the unconscious ambivalent attitude of parents towards their child's education in general. As a result of this, parents may often be inexplicably critical towards the school. This may reflect poor cooperation between parents and teachers, but through good cooperation these initial problems can be overcome. The relationship between teachers and parents also changes in relation to their changing roles. We may differentiate between the traditional role and the new role in their relationship. The traditional role of a teacher requires them to be knowledgeable. They have to claim to know even if they are uncertain. They keep to their role of expertise, they demand obedience and respect of their position as experts. The new role of teachers also presumes the teacher's expertise (or knowledge), but it also expects them to respect the knowledge the parents possess (which is relevant and important). Teachers are expected to connect with the thoughts, feelings and perceptions of the parents. The traditional role of parents is as receivers. This means that they leave it to the teacher as a professional, and thereby gain a feeling of security based on trust. They only need to follow the advice of the professionals. In the new role the parent becomes a co-worker. They join the teacher (the professional) in resolving many situations, and so gain a feeling of greater inclusion and effectiveness. In this way they are not completely dependent on a professional, but they also take responsibility and control. (Kolak, 2006). Jurić (1994) points out that parents connect with teachers through practical and specific connections, in the very precise interests of the school, through the goals of the education of their child. As long as the child is successful in school, relationships with teachers most often are not questioned. But if problems arise, the parents change their attitude to the school and egotistical motives come to the fore. Conversations between teachers and parents revolve around failure in the school, they increase the tension between the two educational partners (parents and teachers), especially if the school emphasizes the educational and social responsibility for up-bringing and education. For many parents enrolling their child in school is their first contact with a school and teachers since the time when they were students themselves, and the memory of school for many adults is not particularly pleasant. Whatever their memory is like (although they are now adults) their relationship to school and teachers is not indifferent. Moreover, the imbalance in this relationship is increased by the fact that parents are deeply aware of the teacher's power to make their child's life in school pleasant or unpleasant. For this reason they often "dance to the teacher's tune" (Seap, 1993; according to Fuller, Olsen, 2000), out of fear of the teacher making use of that power. In these circumstances it is difficult to build a completely equal relationship. Moreover, most parents and many teachers see the school as the teacher's territory (not the parents'). Therefore they do not feel at ease in school and take on the role of guest, and they see the teacher as the authority and expert in teaching and learning. If the relationships between parents and teachers are unbalanced and unequal like this from the very beginning, it



will be hard for communication between them to be two-way and as between partners. In this case communication comes from the superior position of the teacher, to the inferior position of the parents.

# **Relationships between students**

The school is a place where students establish quite intensive social contacts and where the influence of peers begins to have a strong effect on their behaviour, that is, on their social, intellectual, moral and emotional development. The importance of the influence of peers on the development of individuals has also been confirmed by research, as expressed by Mijatović (1999), whose results show that in equal proportions of 30 per cent the development of each new generation is influenced by the family, the school and the environment - peers. The theoretical model of peer relationships by Bukowski and Hoza (according to Klarin, 2006) was a turning point in research into peer relationships. This model distinguishes two levels of social interaction of importance for relationships between students in a school. The first level is the expression of group relationships with peers, which is a one-way relationship and is linked to peer acceptance. This dimension tells us about the popularity of a student, and is a general, group-oriented and one-way construct, as a reflection of the relationship of peers towards an individual student. The second dimension of this model is the specific, mutual, long-term and two-way relationship, which is a reflection of experience between two individuals, and it is characterized by loyalty, intimacy and mutual attraction. These and many other authors call this kind of relationship friendship. Differentiation of these two levels of social interaction is in line with the motivation of students to meet various social needs. Students meet their need for belonging in peer groups, through attraction and desirability, and their need for intimacy and closeness in a relationship with a friend (Klarin, 2006). Coie's classification (2007) distinguishes five categories of students in terms of their interpersonal relationships. These are: popular children, rejected children, neglected children, controversial children and average children. Other authors (MacDonald, 1991, Legault, 1993, Torrey et al. 1996) distinguish four categories in terms of the degree of preference or rejection of students by their peers. A student who has a large number of negative nominations is a rejected child. A student who has a small number of positive nominations and a small number of negative nominations is an isolated child. We say that students who have a large number of negative and positive nominations are controversial. A student with a large number of positive nominations is known as a popular (star) student. Popularity has a positive effect on relationships between students. Neglect and rejection comprise the negative side, which relates to unpopular students. Neglected students are rarely chosen as friends, they are shy and isolated. Sometimes these students develop their own individuality in their solitude, but if a feeling of loneliness arises alongside their neglected social status, they may be liable to suffer from depression and emotional indifference. In contrast to them, rejected students show maladjusted forms of behaviour, such as aggression, withdrawal, solitude, and school failure. Their status in the group and in interpersonal relationships is very important for students. The knowledge that they are accepted makes them happy (Kolak, 2010). Empirical findings show that there is a bi-directional effect between peer relationships and school achievement. This means that the quality of peer relationships affects school achievement and, vice versa, school achievement affects the quality of peer relationships (Krnjajić, 2002). Peer relationships influence not only current but also later academic, behavioural and emotional development. Accepted students are often more successful academically, whilst the status of rejection is linked with academic difficulties and poor achievement in school. Peer rejection is a relatively stable characteristic on the basis of which difficulties in the coming years may be predicted, such as repeating years, leaving school early, unexcused absences, adjustment problems... (Spasenović; 2003).

#### **Relationships between students and teachers**

In contrast to the relationships considered above within the school system, research into the relationship between students and teachers in the learning process are still rare. The student-teacher relationship is considered within various theoretical frameworks, and one of the most frequent is the attachment theory, which conceptualizes this relationship as the continuation of the parent-child relationship. The quality of this relationship within this theoretical framework is considered in three dimensions. These are the dimensions of closeness, conflict and dependency (Pianta, 1999). Closeness presumes a high level of warmth and openness in the student-teacher relationship; conflict defines interaction, with contradiction and coercion, and dependency is aimed at excessively dependent behaviour by the subjects in the educational process. It is presumed that the success of teaching and learning itself depends greatly on the quality of the interpersonal relationship between the student



and teacher (Klem and Connel, 2004). A good relationship between teachers is also described by some authors in terms of patience/impatience and gentleness/harshness (Devine, 2003). Taking into consideration the dimension of influence (dominance/submissiveness) and the dimension of proximity (cooperation/opposition), Brekelmans et al (1993) distinguished typical interpersonal relationships between teachers and students as the following types: directive, authoritative, tolerant/authoritative, tolerant, uncertain/tolerant, uncertain/aggressive, repressive, and drudging. The ideal in spiritual and scientific pedagogy is a teacher-student relationship characterised by closeness, that is, a teacher-student relationship characterised by an intensive emotional relationship and the holistic development of the student, with the emphasis on personality. One of the bestknown ways of measuring the student-teacher relationship is using the Questionnaire on Teacher Interaction, which was originally developed in The Netherlands (there are also American and Australian versions), which measures students' perception of the quality of the interpersonal relationship with the teacher, the students' selfperception of their own behaviour, but also the teacher's perception of ideal behaviour (Šimić Šašić, 2016).

### **Relationships between teachers**

This relationship, in comparison with all other relationships, has been consistently neglected and has been researched least. Regardless of the fact that it is not directly related to the student, it has a significant effect on the quality of work in a school and its effectiveness, as well as on job satisfaction. A lack of cooperation and interaction with colleagues, and the tendency of teacher towards individualism and isolationism are mentioned as serious problems within these relationships in schools (Bilić, 2016). Barth (2006) distinguishes four types of relationships between teachers: parallel play, adversarial relationships, congenial relationships and collegial relationships. Halpin's dimensions of the organizational climate of schools (according to Domović, 2004) indicate four dimensions of teacher behaviour which also reveal their relationships with other teachers. One of these relates to teachers' tendency "not to be present" in school. It describes those staff who do their job superficially, and this dimension is known as "disengagement". The dimension "hindrance" relates to the teachers' feeling arising from unnecessary burdens, mainly imposed by the principal. The dimension entitled "espirit" denotes the relationship of staff who meet their social needs in the school and at the same time enjoy their achievements at work. The dimension "intimacy" relates to teachers who enjoy friendly interpersonal relationships. This dimension describes the satisfaction of social needs which are not necessarily connected to the realization of tasks. Relationships between teachers may be considered within three very clear dimensions (Hoy et al, 1991). These dimensions are: collegial behaviour, intimate behaviour and disengaged behaviour. *Collegial behaviour* between teachers is characterized by enthusiasm, acceptance, mutual respect, a feeling of enjoyment in working with their colleagues, and a feeling of pride in belonging to the school. Intimate behaviour in terms of the relationship between teachers signifies cohesion and a strong social support network, where the teachers know each other well. Close friendships grow, as well as strong social support for each other. In disengaged behaviour, problematic relationships are characterized by a judgemental, critical attitude and dissatisfaction. There is a visible lack of cooperation and common goals, as well as a lack of focus on work and relationships. These dimensions have been developed as the fruit of research by authors focusing on elementary schools. The same team of authors focused on the same research goal in order to examine the interpersonal relationships between teachers in secondary schools and, as a result of that research, they also distinguished three dimensions which they called: engaged teacher behaviour, where the teachers support one another and enjoy working together, frustrated teacher behaviour characterised by mutual interference and distraction, and relationships characterized by mutual irritation, annoyance and interruption, and intimate teacher behaviour characterized by close friendly relationships between teachers, accompanied by regular socializing, with a strong and cohesive network of social relationships.



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# Investigating School Effectiveness in Rural Setsoto Municipality Area (Free State Province, South Africa): A Strategy for School Improvement

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# ABSTRACT

This case study investigated how the schools in rural context in the Setsoto Municipality Area in the Free State Province, South Africa, maintain their effectiveness. Principals of rural schools have to manage rural schools offering multi-grade teaching and learning without any form of training offered. Despite efforts by Department of Education to improve rural schools effectiveness, rural schools have persistently presented a different set of challenges. Data were collected by means of questionnaire and interviews with five Principals managing rural schools in Setsoto Municipality area. Collected data were analysed using the content analysis framework. In this study, trends in rural education in developing and developed countries as well as challenges of Principals and teachers most whom have or no training in managing multi-grade teaching in rural context are explored. The findings of the study revealed, among others, a need for training rural school principals on how to manage their schools effectively and efficiently. The study also proposes an establishment of functional district rural school clusters led by Professional Learning Committees (PLCs); a network at Districts, Circuits and Cluster level where multi-grade principals can share their experiences and challenges with each other. While the study was conducted on a small scale with a few principals in rural schools, it lays a solid basis for understanding school effectiveness in rural schools of similar contexts.

Key words: school improvement, multi-grade teaching, rural school.

# INTRODUCTION

School effectiveness refers to the level of goal attainment of a school (Willims and Somers, 2001; De Volder, 2012). School effectiveness is defined as the process by which, the school accomplishes its objectives (Makoelle 2011; Willims and Somers, 2001; De Volder, 2012). Therefore schools with high effectiveness are referred to as effective schools. Also, Lezotte (2013) defines an effective school as a place where students can feel safe, physically and emotionally. It must be a supportive community where learners and the teachers of all backgrounds can focus on teaching and learning. Lezotte (2013:2) further advocates the method of positivity in support of effectiveness of rural schools: " *teachers, parents and mentors need to encourage a learning environment in school age kids by treating school as sacred place, where higher respect and positive attitude prevailing.*" Rural school effectiveness is defined in terms of features of good schooling.

Enhancing school improvement and maintaining school effectiveness in rural context presents different challenges than in urban context because rural education has unique set of challenges such as rural school usually experience challenges such as: Poor teacher's status; Poor career advancement; outright neglect of teachers in rural schools; Lack of qualified teachers in rural schools and Problems of recruiting and retaining teachers (Gordon, 2012, Legotlo, 2014, National Education Evaluation and Development Unit (NEEDU), 2013). Teaching in rural schools could be challenging due to, amongst others, poor funding, inadequate preparations and training of teachers; poor infrastructural facilities, instability of academic calendars and a threat of HIV/AIDS.



The role of the educator districts has railed the issue of whether or not its support to schools actually enhance rural schools effectiveness. Chinsary (2002) states that, if the districts provide adequate support to schools, they are likely to do better than expected. Currently, very little support is given to the rural schools; therefore to improve the situation, the districts should provide management training to rural School principals by building the capacity of School governing Bodies and by training teachers in curriculum delivery (Department of Education, 2009a).

The fact that numerous rural schools are regarded as less functional rural schools cannot produce the expected results calls for the identification of strategy, guideline and practice that the Rural Schools Directorate could put in place to ensure that more of the Rural Schools perform at the expected standard (Department of Education 2009a:14). Clear guideline need to be given to Principals of the less functional rural schools to ensure improvement in the quality of teaching and learning and subsequently to improve rural school effectiveness.

# South African Perspective on rural schools effectiveness.

Before the introduction of Curriculum and Assessment Policy Statement (CAPS) rural schools were fully utilizing the same policy as the public schools for curriculum delivery even though their context are not the same. Majority of rural schools in South Africa are practising multigraded teaching and learning approach(MGT) where one teacher teaches more than one grade at the same time, that is, managing or teaching different content at different levels in the same classroom in one class (Centre for multi-grade education, 2012; Basic Education Department, 2010; Gomes, 2013). CAPS introduced the multigrade toolkit for rural schools teachers and principals for effective curriculum delivery purpose, however, the situation regarding curriculum delivery in rural schools prior to the introduction of CAPS is still problematic, given the negative experiences of the past for the attainment of good results by the learners.

This study sought to investigate practices which contribute and enable effectiveness of the schools in the rural Setsoto Municipality Area, Free State Province in South Africa. Based on the stated objective, the following research questions were formulated:

- How do rural schools in the Setsoto Municipality Area in the Free State Province maintain their effectiveness?
- What can be done to enhance rural school effectiveness?

# THE STUDY

The literature study provided a picture of practices employed to maitain school effectiveness particularly with schools in rural areas. Masitsa (2005) argues that a literature study is intended to support statements and points of view with research evidence, as empirical justification requires reference to other research. The literature consulted in this study provided a theoretical framework against which the findings were interpreted and discussed.

A mixed method approach was used in this study to investigate how rural schools in Setsoto Mununcipality Area in the Free State Province in maintain their effectiveness. This approach enabled the researchers to capitalize on what is normally viewed as the strength of one method in away that compensates for what typically been viewed as the weakness of the other (McMillan and Schumacher, 2014).

Participants involved in this study comprised five(5) principals purposively sampled from rural schools in the Setsoto Municipality Area, i.e. two primary rural principals, two rural intermediate principals, and one rural secondary or combined principal in the Setsoto Municipality rural school. The five rural school principals selected had more managerial experience in the Municipality area compared to the rest of the principals in that municipality area. Three of the participants, Principals A, B and C were heading relatively well resouced and functional schools whereas two other Principals (D and E) were from poorly resourced and less functional schools. Data were collected by means of questionnaires as well as the interviews with these principals. This was done to elicit the facts about reality of the phenomenon being studied (McMillan and Schumacher, 2014; Leedy and Ormrod, 2014) A study using more than one method is fuller or more compressive than the one using only one method (De Vos, Strydom, Fouche and Delport, 2007, Cohen, Manion and Morrison, 2010).



Compressive questions were formulated and constructed such that they may be tailed, coded and analysed as accurately as possible to solicit information pertinent to the study. Content analysis was employed (De Vos, Strydom, Fouche and Delport, 2011; Gall, Gall and Borg, 2007; Berelson, 1991). Data were organised, checked for accuracy, categorized and then analysed in accordance with the themes and categories that began to emerge from the study.

### FINDINGS

The five rural school principals selected comprised two females and three males. All five principals did not have any formal training in managing rural schools and multigrade classes. The following themes emerged from the study:

#### Basic functionality and staff development (management and curriculum).

The study revealed that the management style of the principal and staff development influence the effectiveness of rural schools positively (Hattie and Alderman, 2012).. These include proper planning, well implemented year plan, democratic style of management and continuous teacher development sessions, induction of newly appointed educators, motivation of staff and learners, marketing, conflict management, control of work, cooperative learning, reflective teaching, professional training committees, employee wellness, principal diary, communication, quality management, interpersonal relations, inclusive education, teaching and learning, staffing, peer tutoring, management trainings and development sessions i.e. (establishment of functional district schools cluster led by PLC's, a network at Districts, Circuits and Cluster level ) where multi-grade principals can share their experiences and challenges with each other as well as share teachingand learning materials (Lezotte, 2013, Makoelle and Malindi, 2014).

It is evident that departmental collaboration, proper –record keeping, regular visits by MGT Learning Facilitators and the involvement of principals in the running of the rural schools all have a profound influence on rural school effectiveness (Mvubu and Hlalele, 2012; Gomes, 2013).

When asked about the value of the importance of planning in advance, quoted verbatim, Principal B from a relatively functional school stated that:

"I have to plan for the day, term and year, this means determining daily objectives, medium-term plan and long term plan, then organize resources both for human and physical, lead by giving clear direction and instructions, then making follow-up to see that they are carried out. Again as principals we should establish functional Professional Learning Committees (clusters, circuits, districts) for capacity building purposes".

While Principals E from a less effective rural schools seemed unsure and responded as follows:" it seems *seems* as if waste my valuable time. I work when I am in my office'.

Regarding management styles and decision making process all three principals from functional schools, that is 60% agreed that they adopt a democratic style of management and sit down in meetings and make decisions together with their staff (team work is emphasized) while the two principals principals of less functional rural schools indicated that they adopt an autocratic style of management and make decisions alone.

#### Holistic development of the child

Holistic development issues such as safety of the learners, discipline of the learners, treatment of learners, overcrowding, Learner Governing Body (LGB),National School Nutrition programme (NSNP), learner transport, Health Programmes, Safety and protection programmes and alcohol and drug prevention and management programmes are pivotal to rural school effectiveness (Makoelle and Malindi, 2014, Mulkeen, 2005). To substantiate this, a verbatim quote from a principal from a privileged school regarding safety and protection programmes:

### "We do care for the learners by means of clothes, food and psychosocial services".

In contrast, for Principal E, caring of learners concepts are not defined. He indicated that: "We struggle to care for the learners because it is difficult to get donations from the community private companies, not to mention the private companies".



Participants	Area	Strongly agree (N)	<b>%</b>	Agree (N)	%	Partly agree (N)	%	Disagree (N)	%
Functional (A, B and C)	Safety and protection programmes	2	40	1	20				
Less functional (D and E)	Safety and protection programmes			1	20	1	20		
Total		2	40	2	40	1	20		

# **Table 1: Safety and Protection Programmes**

From table 1, two principals of functional rural schools, that is 40%, strongly agree that they do develop and implement safety and security policies and programmes concerning safety and protection of learners. i.e. the adopt a Cop programmes are well implemented. Two (one from functional and one from less functional school) 40% agree and one principal (20%) from a less functional school partly agree.

The less functional rural schools do struggle a lot to address issues of safety of their learners because the schools are not fenced. The rural schools' SGBs also struggle a lot to hire security officials and install alarm systems due to financial constraints.

### Infrastructure development and Resources

The findings of the study validate the research literature in that, infrastructure development and resources aspects such as classrooms, water, sanitation, vegetable garden, renovations, fencing, electricity, physical resources, e-mail service, e-learning specialists, training in computer literacy and ICT integration contribute in enhancing teaching and learning (De Volder, 2012; Lezotte, 2013; Mulkeen, 2005; Wicken, 2011).

It was clear that developed infrastructure do motivate learners to attend rural schools to the fullest and this leads to the profound influence on the effectiveness of the rural school. For example quoted verbatim a principal A; of a functional rural school said:

"The classrooms managed some rural schools are in good conditions. By contrast, less functional rural schools classrooms are not in good conditions. Some have leaking roofs, electrification is not done properly and the floors have potholes."

Participants	Area	Strongly agree (N)	%	Agree (N)	%	Partly agree (N)	%	Disagree (N)	%
Functional (A, B and C)	Resources					1	20	2	40
Less functional (D and E)	Resources			1	20	1	20		40
Total				1	20	2	20	2	

Table 2 :Resources

As reflected on table 2 above, it is clear that, 40% of rural schools managed by rural school principals are not well resourced and rural schools managed by fully functional rural school principals are well resourced. The rural schools managed by less functional rural school principal do not have enough resources due to financial constraints.

# Community involvement and development.

This theme focuses on community involvement and development aspects such as partnerships, stakeholders, school governing bodies (SGB), rural school development plan, meetings, policy development ,project management, learner disciplines, Quality Teaching and Learning Campaign (QLTC), vision and mission statements, teacher recruitment, financial management, fundraising, conflict management, school committees, parental involvement and progress assessment tool. Community structures do play a pivotal role as far as rural school effectiveness is concerned (Makoelle and Malindi, 2014). In support, principal B asserts:

"I always involve the school communities fully to ensure effectiveness, e.g. learners, parents, general workers, private organisations and QLTC structure members at my school".

Participants	Area	Strongly agree (N)	%	Agree (N)	%	Partly agree (N)	%	Disagree(N)	%
Functional(A, B and C)	Community involvement & QLTC	2	40	1	20				
Less functional (D and E)	Community involvement & QLTC	1	20			1	20		
Total		3	60	1	20	1	20		

Table 3: Community involvement and Quality Teaching and Learning Campaign (QLTC)

Information on table 3 above, reveals that 40% of principals of rural schools do work collaboratively with the Quality Teaching and Learning Campaign (QLTC). All the principals involved in the study indicated that they do ensure that QLTC structures are fully functional. Examples of QLTC structures are: the principal, RCL, Councilors, the Clerks, Nurses, Traditional healers, social workers, police-man, etc.

# Ethical issues

The following ethical issues illustrated by Creswell (2009) were addressed:

*Informed consent:* Consent was obtained from the participants of the study and permission to conduct research was sought from The Acting Director of Thabo-Mofutsanyana District as well as the rural schools concerned. *Anonymity:* The right of participants to be anonymous was protected, both in the structure of the questionnaire and the interview schedule as well as in the analysis of the results.

# CONCLUSION

The study revealed, among others, a need for training rural school principals on how to manage their schools effectively and efficiently. There is need for a clear policy about multi-grade schooling to enable the Departmental Officials at all educational levels to cope with the quest or direction. The fact that the teachers and principals are trained for the mono-grade setting and are unprepared for the multi-grade teaching environment only increases confusion. Models for multi-grade teaching can be developed with the assistance of UNESCO or the World Bank. Rural school principals and teachers should be able to use computers and mobile technology in teaching in their classes The study also proposes an establishment of functional district rural school clusters led by Professional Learning Committees (PLCs); a network at Districts, Circuits and Cluster level where multi-grade principals can share their experiences and challenges with each other.



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# Language Teacher Training Program Evaluation Using a Mixed Method: A Case Study of a Korean In-Service Teacher Training Program

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# 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; Diáz-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 subactivities, 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. 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 (Kinginger, 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 interculturally.



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.

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# Investigation of Teachers' Point of View about Reflecting the Quality of School Life for Classroom Management

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# ABSTRACT

This is a qualitative study investigating the teachers' view about the influence of the school life's quality for the teachers' classroom management behavior. The research involved 10 participating teachers, three of whom working at a primary school, four of whom working at a secondary school and three of whom working at a high school in the town of Tercan in Erzincan. The data was collected through interviews and analyzed by a descriptive content analysis. According to the results of the study, positive feelings about the school encourage teachers to be more active while negative feelings cause them to employ more interventionistic human and behavior management methods. Positive relations among teachers enable teachers to make interdisciplinary connections more easily whereas negative relations cause depression and decrease the efficiency of the lesson. Good communication between teachers as well as between teachers and students empowers teachers to become more active in teaching and more positive in classroom management while communication problems cause teachers to move away from the students and to react more authoritarian. The structure of the syllabus forces teachers to conduct their lessons test-oriented, which leaves emotional impressions such as anxiety, stress and tiredness on the teachers. A negative attitude of the school administration towards the teachers causes teachers to be more authoritarian and to execute their lessons not effectively while negative behavior towards the students causes them to be more protective about the students and impedes discipline. Key words: Quality of school life, Classroom management, Teacher

# **INTRODUCTION**

The aim of education-teaching activities is to provide students' gain the targeted behaviors previously and gain them as a healthy individual to the society. The main duty of the teachers in this process is to implement teaching activities and manage the classroom in an effective way by arranging the classroom environment in this direction. Classroom management is generally defined as removing the working barriers of students and teachers (Erdoğan, 2003), providing curriculum, teaching method, time, location and coordination of students (Sarıtaş, 2000) and making teaching-learning process effective (Martin & Yin, 1997). According to Martin, Yin and Mayal (2008), classroom management is established from three dimensions as management of instruction, behavior management and people management as constructional. Management of instruction includes preparation of course activities. Providing the sitting arrangement in the classroom and time management. Strategies related to preventing human behaviors before realizing is in the content of behavior management. People management includes strategies which teachers use while developing their relationships with their students. Implementation of teaching activities in an irregular classroom environment becomes difficult, the students' attention is lost, participation in the activities decrease and academic success falls. (Doyle, 1986). Because of this reason, training of teacher candidates and students to make them successful in the class management has a great importance.

Classroom management is a multi-directional, difficult and complex duty. Because teachers may be affected from many variables in or out of the classroom directly or indirectly and may exhibit different attitudes and behaviors while managing their classrooms (Aydın, 2004). Because of this reason, the way of teachers' managing their classrooms, individualistic properties, academic experiences, beliefs towards education and attitudes towards classroom management is frequently subject of many researches. (Ekici, 2008; Foxworthy, 2006; Güvenç, 2012; Güvenç & Güvenç, 2014; Okut, 2011; Oğuz, 2013; Saeedi, 2016; Sridhar & Javan, 2011;



Tuna & Savaşçı, 2016). According to Martin, Yin and Mayal (2006), teachers exhibit three certain attitudes as interventionist, non-interventionist and interactionalist while managing their classrooms. The teachers with interventionist attitude are the teachers who establish an authority on the students, control their students' behaviors with a punishment or an award. Non-interventionist teachers believe that students can manage their behaviors by themselves. They do not impose their rules and present them opportunities to correct their behaviors. The teachers with interactionalist attitude share the responsibilities with the students by including the students in taking decision process. The teachers may exhibit different attitudes at different dimensions of classroom management. However, is observed that they frequently exhibit a more dominant attitude (Martin, Yin &Baldwin, 1998).

School and classroom cannot be thought different from each other. Classroom is a piece of school and teachers and students spend most of their time in this living area. Because of this reason, living quality of the school in which the students and teachers spend thousand hours of time increase in education more and more. Quality of school life is mostly defined as "School satisfaction" and "happiness situation existing at the result of experiences at school" (Karatzias, Power & Swanson, 2001). This comprehension is established from three dimensions as student satisfaction, studies of students at school and reactions of students towards their teachers (Epstain & McPartland, 1976) later new dimensions are added. For example, Johnson and Stevens (2001) examined school living quality by focusing on support given to the students, relationships, innovations and participation in the new decisions taken, on the other hand Sari (2007) took the dimensions of school living quality as feelings related to the school, school management, teachers, status and teaching programs. According to Mok and Flynn (2002), positive and negative feelings towards school has a power of affecting school life quality, success of a person and general life quality which are directly related with self-trust of the individual. In the related researches show that academic success, life satisfaction, self-respect, ownership of school feelings of the students who perceive school quality positively increase, absenteeism at school and problematic behaviors decrease. (Inal, 2009; Javaal, 2007; Jimmieson, Hannam &Yeo, 2010; Mok & Flynn, 1997; Hunt-Sartori, 2007; Lee, Zhang &Song, 2011; Leonard, 2002; Xu &Zhao, 2012; Huang, Benson, Zhu &Sardeshmukh, 2014; Zeynivand, Hashemi, Aghdam & Ahmadi, 2014). The researches which examine school life quality in the frame of teacher perceptions have been so limited and they are oriented to determining school living quality perception of the teachers (İlmen, 2010; Kesici, 2010; Korkmaz, 2009; İnal, 2009). A research examining what have been effective at school living quality perception of the teachers and their reactions about the school could not be reached. However, school quality pointing formal and informal living qualities of the school states an environment in which they feel themselves happy and safe, satisfied from the social relationships and teaching implementations for the teachers sharing the same environment and for the students. In other words, teachers' feelings towards school establishes their perceptions related to their school living quality ideas on their feelings towards school, how valuable they feel themselves at school, quality of their communication with managers, teachers, students and parents and their ideas and ideas about the teaching implementations (Sarı, 2007). Because of these reasons, there has been a need for a research which examine the ideas deeply how the school living quality in which the teachers work and classroom management behaviors affect them.

#### **METHOD**

#### The model of the research

This is a qualitative study investigating the teachers' views about the influence of the school life's quality for the teachers' classroom management behavior.

#### Working group

The research has been realized with totally 10 teachers including three elementary school, four secondary school and three high school teachers working in Tercan district of Erzincan. Quality of School Life Scale (QSLS) which has been developed by Sari (2007) has been implemented to the teachers working at elementary, secondary and high school teachers in the center of the district to form the working group and looked for how the teachers perceive living quality level of their schools. Later, ten teachers who work at different levels with maximum diversity sampling and as a volunteer and who perceive school living quality lower and higher have been determined. Five of the teachers are male, five of them are female. Their total working periods change between 1-16 years, five of them works at secondary school, three of them at high school and two of them at



elementary school. The branches of teachers working at secondary school are English, Turkish, Mathematics and Science; the ones at high school are Mathematics, Music and Turkish literature language. The ones working at elementary school are classroom teachers.

# Data collection instruments and data collection

Research data has been collected with an interview form developed by taking expert idea in the direction of QSLS dimensions by the researchers. Questions on feelings related to school, relationships with school, communication with students and parents, school management, teaching program and of quality of teaching implementations take place in the interview form. The interviews have been realized in guidance and teachers room on the dates and time which the teachers determined, they have been completed in 25-30 minutes. Soundrecord device has been used during the interview by taking the approval of the interviewers.

# Data analysis

Descriptive content analysis technique has been used in data analysis, firstly sound records have been printed and 98 pages of text have been taken as data. General frame for coding has been determined in the direction of interview questions, detailed codes existed at the result of examination of codes. Written texts have been read by the researchers one by one, "reading" and "returning to literature" procedures during coding have been reviewed. The safety of coding has been calculated by Miles and Huberman's (1994, p. 64) formula, orientation between the coders has been found as .85. In case of being different coding, the researchers decided together what the coding will be. Lastly data has been arranged in the tables to describe the frequency of revision of the codes. While the findings are explained, quotations from the teachers' statements have been made directly and codes such 1EL and 6KI have been used (For example;1EL male working at high school; 6KI female teacher working at elementary school).

# FINDINGS

# 1. Feelings of teachers towards school and their views about the effect of it on classroom management **behaviors**

Firstly, teachers' feelings towards school, the situations which make them feel these and how they affect their behaviors in the classroom have been asked. Eight teachers have been generally happy, two teachers have been unhappy, all participants gave examples of situations which cause them to feel positive or negative feelings. Table 1 summarizes the explanations of the teachers.

Feelings towards school	f	Effect on classroom management behaviors	f
The situations which felt positive feelings			
A warm school environment/orientation			
between teachers	4	Being more cheerful and positive in the course	6
Students' being pure	2	Feeling teaching will	3
Love and respect of students	1	Being more patient	2
Love and respect to the teachers in the			2
society	1	Making the course more joyful	
Feeling yourself strong	1	Having positive relationships with the student	2
Orientation between the teachers	1	Having fun from the course	1
Warm relationships which keep distances	1	Giving examples related to the students	1
Working wish of students	1	Implementing positive discipline	1
Preferring the school by their wish	1		
Occupation love	1		
Being a small settlement	1		
Being a small school	1		
The situations which felt negative feelings			
Negative attitudes of school managers	3	Being angry	5

Table 1: Feelings towards school and their effect on classroom management behaviors

Being angry



Students' being uninterested to the lesson	2	Giving rigid reactions to the students	4
The students' readiness level is low	2	Following a teacher centered process	4
Being a group between the teachers	1	Not having communication with the students	4
Teachers' not completing their work	1	Sulky face statement	3
Showing rigid reaction to the male-female			
relationships	1	Explaining the course unwillingly	2
School's not being clean	1	Having monotonous course	2
Uninterested parents	1	Not caring the students	1
Administrative gaps	1		
Country longing	1		
Not having a team spirit	1		
Not developing yourself as vocationally	1		

As seen in Table 1, a warm school environment/orientation, students' being pure are the basic factors for the teachers in establishing positive factors towards school whereas negative attitudes of school managers, students' being uninterested to the lesson, the students' low readiness level are the basic factors for the teachers in establishing negative factors towards school. Positive feelings related to school provide the teachers to be more cheerful and positive in the lesson, negative feelings cause them to be angry and tense and giving rigid reactions to the students by following a teacher centered process. Two quotations from the teachers' ideas are as below:

"...I think that when I enter the lesson in an environment full of laughter I am happier. I am more positive. I become more joyful. I do not get angry even if the student makes a negative thing" 2KO

"...I am so much unhappy because of the students' level. I think that my students go backward ...I cannot do anything. Because of this reason I became an ordinary teacher. I am so unhappy because of the attitudes of the managers and their communications with us"10KO

# 2. Quality of the relationships between the teachers and views how they affected classroom management behaviors

The explanations which the teachers made why they thought the relationships between the teachers have been positive and negative are summarized in Table 2.

Quality of the relationships between the teachers	f	Their effect on classroom management	f
		behaviors	
The situations which felt positive feelings			
Making cooperation preparing plan and programs,			
taking the same decision, etc.)	6		
Making idea exchange	4	Providing objectivity	1
Activities out of the school	3	Being relaxed in the lesson	1
Activities in the school	3	Explaining the course in safety	1
Having close relationships	3	Not hesitating while doing something	1
Helping each other	2	Making the course more joyful	1
Making extra studies	1	Being happier in the classroom	1
Not seeing each other's deficiencies	1		
Providing transition between the disciplines in the			
course	1		
Making equal duty distribution	1		
Realizing the responsibilities	1		
Moving in orientation	1		
The situations which felt negative feelings			
Being in groups	3		
Not solving the problems	1	Not focusing on the lesson	2

 Table 2: Quality of the communication between the teachers and its effect on classroom management behaviors

Not taking decision together	1	Getting angry	1
Not having support from the school managers	1	The course's being bored	1
		Not having positive communication	
Being the managers one-sided	1	with the students	1
Having a crowded school	1	Sulky face statement	1
Different point of views toward education	1	Depression	1
Not having cooperation	1		
Not having idea exchange and share	1		
Not being accepted	1		
Not making social activities	1		

As seen in Table 2, making cooperation, making idea exchange, making activities out of the school or in the school, having good relationships with the teachers are the positive situations whereas being in groups, not solving the problems, not being accepted, etc. are the negative situations. The teachers stated that when they are in positive communication with other teachers make them feel safer in the classroom and they did not hesitate while doing something; but when they lived the problem of focusing on the course, they entered the classroom angry and with a sulky face their communication with the students are affected in negative way. Here are sample quotations:

"...Whenever there is a real problem, even my uninterested friend tells that we can solve the problem together and asks how he can help me. The school we work is very important because we are mostly at school. When my student tells about another teacher, I can evaluate it objectively" 3Eİ

"... I do not feel alone, I explain the course in more trust and I am more comfortable as I know that there are people whom I can take help in building relationships between the lessons" 8KO

"...sometimes things which the students should not hear are heard by them, this makes us depressive when we hear about these in the lesson, this decrease our motivation for the course ...I go on with the lesson, but the course becomes very boring, the time does not pass for me, the lesson also becomes more boring for the students" 7GEL

In this content, another question asked to the teachers is what behaviors which they do not approve and they appreciate and how these affected classroom management behaviors. The explanations of the teachers are summarized in Table 3.

		Their effect on classroom management	
Behaviors of teachers at school	f	behaviors	f
Appreciated behaviors			
Spending too much effort for students	3	Joking with the students	1
Having positive dialogues with the students	3	Motivating students for the course	1
Developing yourself academically	2	Being comfortable in the classroom	1
Spending time with students out of the			
lesson	1	Implementing different activities	1
Knowing their children	1	Using different stimulants in the lesson	1
Being successful in their fields	1	Using resource books	1
Not being oriented to violence	1	Concretization of abstract subjects	1
Making idea exchange with the teachers	1	Presenting the subject visually	1
Building empathy	1	Solving extra questions	1
Being interested with students like a father			
and a mother	1	Making research	1
Making religious education	1	Knowing student better	1
		Being able to protect the distance between the	
Set the distance between the students	1	students	1
		Taking as an example	1

**Table 3:** The effect of behaviors which are appreciated and not approved by teachers on classroom management behaviors



. . . . .

Not appreciated behaviors			
Having communication with the students in		Trying to help to the students (listening, trying	
social media/excessive friendship	3	to solve their problems etc.)	4
		Passing the complaints about the teacher over	
Insulting the student/ speaking rudely	2	in the lesson	2
Putting arbitrary prohibitions for the		Trying to take the attention of the students for	
students	2	the lesson	1
Entering the classroom lately/getting out of			
the classroom earlier	2	Ignoring	1
Behaving rude to the students	1	Being in hard situation in the lesson	1
Deviation from the subject of the course	1	Not being adapted for the course	1
Not developing yourself on your field	1	Being tense in the lesson	1
Judging the student without listening	1	Trying to persuade the student	1
Orientation to violence	1	Not being able to manage the classroom	1
Not taking the development courses			
seriously	1	Playing game during or before the lesson	1
Not caring the education	1	Stating the ideas clearly	1
Intervention in the clothes of the students	1		
Establishing homogenous (male/female)			
classrooms	1		
Male teachers' being remote to the female			
students	1		

As seen in Table3, the teachers appreciate spending too much effort for students and having positive dialogues with the students. Behaviors such as developing yourself academically, spending time with students out of the lesson, knowing their children, being successful in their fields, not being oriented to violence follow this. For example, 1EL stated his appreciate about his colleague as "We have a German teacher. I saw how a classroom teacher should on him. He made activities with his students, he went to picnic with them, he takes videos of them since the beginning of the year. At the end of the year all students will be able to watch this video. He went to one of his student's house who will be graduated, only to say goodbye. I appreciate this man. 2KO stated his ideas as "Some of our friends are interested with the students too much. When a student has a problem, he can directly share with them. This is a very nice thing, because sometimes some students beware from their teachers." Having communication with the students in social media, insulting the student, putting arbitrary prohibitions for the students and entering the classroom lately/getting out of the classroom earlier are the first behaviors which the participants do not appreciate for the teachers. For example, 3Eİ made an explanation as "The thing which I did not appreciate is judging the child without listening. They should listen him/her whether he is right or not. Why did he do that, what promoted him to this behavior. May be, we created this situation", 8KO stated the unapproved behavior as "I do not approve my colleagues' punishment system. A ball crashed his car and playing with ball is prohibited. I am so uncomfortable about this subject. The children were too sad today". The teachers' explanations related to the effect of these behaviors on classroom management are given as below:

"I cannot stay like that when my friends try their best for the children. I take photocopy from the extra resources for them, I give some of them as homework. I make researches in Internet" 9EO

"... when a teacher kids physical behaviors of a child, a change occurs on me when I see the face of that. I began to behave better to the children." 1AEL

"My teacher, A teacher behaves me like this but why do you behave me in another way. He tries to hide my faults, why do you try to show them? We are unwillingly stuck in a different situation" 5EEL

3. Quality of communication with the students and views related to how they affected classroom management behaviors



Table 4 summarizes the explanations of student feedbacks which make them feel well when their communication with the students have been good, their problems and their reflections on classroom management behaviors.

Quality of student-teacher relationship	f	Its effect on classroom management behaviors.	f
Student feedbacks		-	
Telling their teachers their love and greeting		Practicing the activities comfortably	
their teachers, etc.	2		
Being respectful to the teachers	2	Authority based on love	2
Sharing their problems with their teachers	1	Having an efficient course	1
Trusting their children	1	Giving award	1
Not telling lie	1	Giving examples from daily life	1
Studying for their lessons	1	Explaining the course with a smiling face	1
Telling that they love the lessons	1	Not disturbing the lesson	1
Being comfortable while stating themselves			
(hugging the teacher, being with the teacher)	1	Making the students active in the lesson	1
Living problems			
Abusing the good will of the teacher	4	Decreasing communication with the students	6
Prejudices related to the course	2	Sulky face statement	5
Students' being angry	2	Unwillingness about the lesson	5
Academic failure	1	Being in authority/continuous intervention	3
Students' being jealous of each other	1	Teacher centered education	3
The students' having an attitude against the			
teacher	1	Getting angry with the students	3
The students' swearing to each other	1	Giving reaction in an unexpected time	2
Difficulty of communication between male			
students	1	Having eye contact	2
Being disrespectful to each other	1	Using different methods and techniques	2
Discussion of students with each other	1	Making the course joyful	1
		Having time problem	1
		Depersonalization against the students	1
		Showing more performance	1
		Not seeing the behavior	1
		Not reaching the aim of the behavior	1
		Punishing the classroom	1
		Threatening (sending to the administration)	1
		Taking attention with technology usage	1
		Using daily problems	1
		Leaving the game in half	1
		Using time better	1

Table 4: Quality of communication with the students and their effect on classroom management behaviors.

As it is seen in Table 4, the students' telling their teachers their love, being respectful to the teachers, sharing their problems with their teachers are the dominant situations which make teachers feel that they have good communication with their students. For example, 3EI made an explanation as "*The students can explain their problems to me without any hesitation. They know that their teacher does not hit them, insult them. I always listen to them...They try not to tell lie as they know that I will be unhappy*", 4KO gave examples from his students' behavior as "... there era some students who tell that they loved Mathematics because of me. I know the others that if my lesson is free they want to enter my lesson". Reflections of positive communication on classroom management has been stated as practicing the activities comfortably, authority based on love, giving examples from daily life, explaining the course with a smiling face, making the students active in the lesson.

The communication problems living between the student and teacher are sourced from abusing the good will of the teacher, prejudices related to the course and students' being angry. The teachers stated that decreasing communication with the students, having a sulky face statement, unwillingness about the lesson cause communication problems with the students. Here are some quotations:

"When I have a strong relationship with the students, I can implement every kind of activity comfortably, the course becomes more efficient" 4DKO

"I suddenly become cold against students; I think that I did not behave so closely. My course explanation will get away at that moment. I have the course only by writing on the blackboard and try not to have communication with the students after the lesson." 9EO

"...they adopted themselves as I do not understand or I cannot do. At that moment, they leave the course and only start sitting... This makes me angry. I get angry out of my control. I can give negative reactions even in the classroom environment" 4KO

# 4. Quality of teachers' communication with parents and their views related to how this affected classroom management behaviors

Five teachers emphasized that they have good relationships with the parents (speaking on the phone, interview at or out of school face to face, home visits) and these shares awakened the will of observing the student in the classroom environment healthier and teaching. For example, 3Eİ explained this situation as "Very interested parent causes to make more observations on me. I observe all of my students, but I observe the children of interested parents more". 7EL stated his idea as "...when you know the family of the teacher, you feel that you know the child better... you become more wishful, you teach him things which he can benefit in the future". Five teachers who have problems with the parents stated the reasons as reactions which show against low grades, not coming to school, being insensible to the education of the child, intervening in the teacher's duty, choosing the teachers whom they will be in communication according to their branches etc. Negative reflections of parents against these behaviors in classroom management have been stated as developing negative attitude against the student, not wishing to explain the course. Not making extra courses, being angry. Explanations from some of the teachers are given below:

"... the students can carry an event at school in a different way. As this causes misunderstandings, an antipathy is established... I try to give deficient right of speaking to that student and I punish him in this way. This causes decrease in the motivation of the student. Also, mine too" 5EL

"...I try to be more careful while I discuss with a student whose parent I know. May be this is not true but I beware that they think falsely about me" 8HKO

"I have negative point of views for the children with whose parent I have problems, I approach the student with some different attitudes, this is out of my control. I try to find his fault such as controlling whether he did his homework or not, or he studied or not" 10KO

# 5. Quality of teachers' school management and their views related to how this affected classroom management behaviors

All of the teachers evaluated that managers behaved negatively to the students and six of the teachers told that they behaved negatively told the teachers. The explanations have been summarized in Table 5.



Debenien stales of the mean stale	£	Effect on Cleanson Mension Del	£
Benavior styles of the managers	1	Effect on Classroom Management Behaviors	1
Positive behaviors against the teachers			•
Listening their problems	4	Entering the classroom with self-trust	2
Supporting them	4	Coming to school by willing	1
	2	Finding the opportunity of thinking	1
Being fair	2	deficiencies	1
Not seeing the deficiencies	1	Being patience /understandable	1
Providing resource	1	Listening to the students	1
Having time in teachers' room	1	Using different techniques/methods	1
Making warnings to the teachers	1	Feeling strong	1
Being modest	1	Giving the course in an efficient way	1
Being understandable	1	Being relaxed in the classroom	1
Negative behaviors against the teachers			
Not having communication	3	Being more authorizer in the classroom	2
Not giving support	3	Having problem because of lack of material	1
Speaking with a hard voice	2	Trying to solve the problems by self	1
Not leading anyway to the student	1	To be obliged to use an official language	1
Decreasing the teacher respectability in the view			
of student	1	Scolding the students	1
Bring lived problems forward continuously	1	Will of getting away from school	1
Approaching the events emotionally	1	Sulky face statement/angriness	1
		Giving less examples in the lesson/ making	
Trying to force his decisions	1	straight explanations	1
Not taking the ideas of the teachers	1		
Not being open to the critics	1		
	3	Not providing discipling in the algornam	2
Nonsting hologing and installe students	3 2	Poing more protective	2
ivegative benaviors against the students	3 1	Deing more protective	2 1
Anger/ snouting/ dawing out	1	Define obliged to satisfy the students	1
Excusing negative behaviors	1	Not naving the course	1
Not having communication with the students	1	I rying to speak with the students Worning the students by conding them to the	1
Being uninterested to the students	1	warning the students by schuling them to the	1
Not having information about the students	1	Indiagers	1
Not having information about the students	1	Living distraction decrease	1
not being toterant	1	Doing obligged to be interested with	1
Exhibiting inconsistant kabassian		being obliged to be interested with	1
Exhibiting inconsistent benaviors		everytning	1
violence implementation			

 Table 5: Behavior styles of school managers to the teachers and students and its effect on classroom management behaviors

As seen in Table 5, the main behaviors perceived as positive in manager behaviors are listening their problems, supporting them and being fair. 6Kİ stated that entering the classroom with self-trust, coming to school by willing, being patience /understandable against the students are because of the managers' positive behaviors and told that *"He asks us while taking a decision. He drinks tea at every break with us in the teachers' room, he asks whether we have a problem or not. When you know that the managers support you, you enter the classroom with self-trust" and 8KO told that <i>"Whenever he wants to tell something he does not tell it with a command. He requests it. I am so glad about it. I never saw that any of our request is rejected by him".* Six teachers who evaluated the teachers' behaviors as negative stated these as not having communication, not giving support, speaking with a hard voice, decreasing the teacher respectability in the view of student.



The teachers who stated that these kinds of behaviors cause the students to be more rigid mentioned that they had sulky face statement, they got angry, they wanted to get away from the school as soon as possible. For example, 1EL stated his idea on this subject as "I told that we should buy different instruments for the school, w make the music room different, we had money, but I could not take any support, when I could not buy these, I was affected negatively", 10KO stated his idea as "As I cannot state myself, I do not make any effort to correct the situation. I want to get away from the school as soon as possible. But I never reflected my anger to the students. But my mode is low and I am in depression."

The teachers stated the negative behaviors of school managers to the students as shouting, getting angry, excusing irrelevant behaviors, being uninterested, implementing violence and not speaking with the students and 4KO told that "The children are being hit by the managers, they are being insulted by the teachers, they are being educated without love. I Know that I heard a stick sound after I left the classroom". 9IEO stated as "...to interfere with the negative situations, he becomes uninterested. This causes the children's spoil". 10İKO told that "...An imbalance is existent in the attitudes of the managers to the students...Unfortunately every behavior is met with an excuse in our school. The teachers who stated that these kinds of behaviors oriented them to protect the student mentioned as not providing discipline in the classroom, speaking with the students by living the lesson, satisfying them. Two examples are given below:

"I cannot get angry with the students. Because I think that as they have been continuously pushed and beetled, they need love. They need a smile, joke, may be some love. Because of this reason I am more moderate on this subject." 4DKO

"Excuse of our manager every king of behavior of the students affects me negatively. Because the students get spoiled more. Sometimes you want to warn as I will send you to the manager. They tell that the manager does not do anything, you can send. The attention of the students who focus on the course is cracked. The course is less efficient." 9EO

# 6. Views of teachers related to how educational program and implementations at school affect classroom management behaviors

The explanations of the teachers who stated negative ideas about the educational program related to the problems being lived at school and their effect on classroom management behaviors are summarized in Table 6.



		The effect of it on classroom management	
Educational program	f	behaviors	f
Attainments	-		
Being above the student level	3		
Being too much	2		
To put the social/ emotional developments	2		
of the students on the back hurner	1		
Making relationship with the other courses	1		
hardly	1		
hardry	1		
Content			
The subjects' being abstract	2		
Having irrelevant units	2		
The subjects' being at basic level or too	2		
much detailed	1		
False knowledge	1	Using different resources	5
Subject explanation is complex	1	Having the anxiety of giving all program	1
Giving importance to some subjects more	1	Having the anxiety of giving an program	4
than the others	1	Being obliged to solve test	4
than the others	1	being obliged to solve test	4
Learning-Teaching process		Making continuous subject research	2
The activities are insufficient	2	Being stressed	2
Making activity without giving information	2	Having difficulty in limiting the subject	2
The activities' being not relevant to the level	2	Giving additional materials to the students	2
		Giving the subjects, which are necessary for	
Having less examples	1	the exam	2
Evaluation		To be obliged to relax the program	1
		Orienting the students to the out of school	
Having insufficient exercises	2	activities	1
Having one type of question in the course			
books	1	Tiredness	1
Problems being lived at school			
Being the course books insufficient	4		
Having less course hours	3		
Giving the subjects, which are necessary for			
the exam (solving test)	3		
Having too much course hours	1		
Not opening courses from basic courses	1		
Not giving importance to the elective			
courses	1		
Being the course hours insufficient	1		
Not having projection	1		
Moving the student exercise books away	1		
Inconsistency of resource books	1		

**Table 6:** The effect of educational program and quality of implementations at school on classroom management behaviors

As seen in Table 6, the negative situation related to the educational programs are being above the student level, being too much, the subjects' being abstract, the subjects' being too much detailed, the activities' being not



relevant to the level, having one type of question in the course books. For example, 5EL stated his idea about the attainments as "I have problems on the reality of attainments. For example, there is an attainment as "writes an essay" ...but the child even does not what an essay is, it is impossible for him to write" 9EO made explanation as "the activities are not relevant to the level. Something is missing for the children" 4KO told that "The exercises are in the form of classical type, I do not find them adequate. You explain the course to the students with classic questions, then they enter the test exams". The problems being lived in the implementation of the educational programs are stated as being the course books insufficient, having less course hours, giving the subjects, which are necessary for the exam. The effect of this situation on classroom management system is using different resources, having the anxiety of giving all program, being obliged to solve test. Two samples from the explanations of the teachers are given below:

"The program in 8<sup>th</sup> grade is too tense, the subjects can be understood better if experiment is done, but as there is TEOG exam, we cannot lose time with experiment, we have to make students solve tests." 10KO

"We try to solve tests without learning the subject. We can miss something out of our control and this situation makes me stressed" 9EO

#### DISCUSSION, RESULT AND SUGGESTIONS

It has been determined at the result of the research that warm environment at school established positive feelings towards school for the teachers; the negative attitudes of the managers, uninterested students and low readiness level established negative feelings. Positive feelings provide the teachers' being more active in teaching, negative feelings cause them to be more intervening in human and behavior management by creating anxiety. This result can be explained by the importance of ownership of school. According to Pagano (1991), all individuals want to see themselves as a member of the group they have been in and to belong to the society they live in to have a comfortable and safe life. The researches which are realized support this idea, stress being lived in the institutions and negative attitudes of school managers affect job satisfaction of teachers and their teaching effort. (Alıç, 1989; Mete, 2006). According to Erden (1998), the teachers feel themselves more successful and safe when they work with the students who are in effort of learning, obeying the directives, having responsibility, their teaching motivation increases and they become more effective in teaching. So, negative feelings sourced from academic success of the students can be because of thinking that they could not take the result of their teaching.

According to the results taken, academic and social shares affect the relationships between the teachers and provide the transition between disciplines in their courses easily. This is an expected and requested result. Because academic dialogues are important in the frame of increasing the quality of teaching and knowledge of teachers on teaching (Cranston, 2002) and developing their professionality (Wang & Haertel, 2001). Orientation of the attributes which are appreciated and observed on other teachers being more active in their courses presents the importance of colleague observation. Colleague observation is the process of observation of teachers' each other's education-teaching implementations, sharing related to the implementations and making evaluations related to these (Bozak, Yıldırım, & Demirtaş, 2011, p.73). The teachers participating in the research does not even observe each other in the classroom environment, their reflection of positive feelings in the classroom can be explained with trust feeling. According to Hanna (1988), trust felt to the colleague plays an important role in the observation of the colleague and it becomes more effective. So, these results can be commented as unity feelings being lived at school develops the trust feeling between the teachers through the time. Reflection of teachers' negative behaviors on the other courses as student complaints and discipline problems are the indicators showing that discipline problems can be because of teachers' behaviors and attitudes. According to Edwards (2004), negative behaviors such as excess forcing, punishment of the teachers can cause the students' show reaction to the teachers.

It has been determined at the result of the research that positive communication with the students provide the teachers be more active in teaching and positive in discipline, communication problems remove the students from the teachers, cause them give more authorized reactions and being more passive. The reason of this may be as the teachers thought their good will may be abused. The teachers are not machines without any feeling. However, the teachers' getting angry, not considering, punishing the classroom, threatening makes the negative behaviors of the students worse and cause the events to realize again (Burden, 1995). According to the results

taken, the structure of the education program and implementations at school force the teachers take decisions at this direction. According to Boys (2000), the students evaluates whether an activity work for them before doing it and at the end of this evaluation they give the decision of participating or not participating in it. Standard programs are inadequate in meeting the learning needs of the students and giving opportunity of developing themselves in the direction of their skills. Even though some teachers are in search of some solutions to eliminate the deficiencies in the educational programs, their solution s are generally related to the preparation of the students to the exams. So, when the solutions do not give opportunity of doing some meaningful things for the students, being uninterested to the course and sustainability of the academic failure is inevitable (Şanlı, 2015). The research showed that negative behaviors towards students by the school managers caused teachers to protect the students; negative parent communication caused negative relationships with the students. In two situations, it can be told that the teachers cannot behave impartial in relationship management. In the direction of these results, it can be told that life quality of teachers has been an important variable which affects classroom management behaviors and the teachers can take emotional decisions about the classroom. In this direction, the proposals below are given;

- Taking care of improvement of program and schools of Ministry of National Education, assignment of school managers who have effective leadership attributes,
- Making effective guidance on effective studying, care, motivation, determining an objective,
- Having a planned and regular studies supporting cooperation and idea exchange between the teachers (workshops, guidance studies, social activities),
- Giving training to the teachers on classroom management, feeling management and academic ethics (sample events, drama, playing role).

#### ACKNOWLEDGEMENT

This study has been supported by Çukurova University Scientific Research Projects Unit (Project no: SYL-2016-7689)

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# Is America Failing A Language? The Case of French Language

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# **INTRO/ MOTIVATION**

Much attention has been paid lately to the "linguistic Achievement Gap" between our nation "American" and others "called European". It's become the focal point for reform programs to discuss the problem of language learning failure between american students learning French language. Clearly, we must fix our system. But how? What do the other nations have that we don't? Is mother tongue become the barrier from learning languages? The **Problematic was that** english language is causing a problem to american students in the process of learning French. It became a main factor that limit the learning process and it might also be a barrier from learning certain rules. This research aims to look at the nature and source of difficulties in giving certain examples.

### **CONTRASTIVE HYPOTHESIS**

Klein (1989) claims that "SLA (Second language acquisition) is determined by the structure of the first language". his theory of Contrastive Analysis (CA) theory assumes that when there is a positive transfer, from a language to another, of similar structures exist in both languages and there is a negative transfer or interference, from a language to another, of different structures in both language. This theory helps us in explaining the source and nature of the errors that the american students make. It also helps us in founding strategies to avoid doing the same mistakes. Mistakes done by the students can be in several fields such as: Phonologie, lexicology, morphosyntaxe...etc. We take for examples some lexical and other mistakes.

<b>Negative Tra</b> Ex: Lexical in	<b>nsfer</b> Iterference: <u>spelling</u>	Ex; False friends	
<u>English</u> person adult group	<u>French</u> person <u>ne</u> adult <u>e</u> group <u>e</u>	<u>English</u> rest ( to relax)	<u>French</u> rester ( to stay)

#### Analysis

American students who are learning French as second or foreign language tend to rely on their native language "English" in the process of learning which cause them problems and the question of interferences or negative transfers come to the surface. Klein (1989) explains the learning processing, regarding it's positive or negative sides, in a very clear way, he says "... close or similar tasks in two languages are easy to understand, different tasks produce a negative transfer which is "errors". Similarities between English and French are considered "positive transfer" which simplify the learning process, such as vocabularies and certain tenses. Differences cause negative transfer "interferences" and they should be considered as obstacles and therefore the problem should be fixed and not only bypass it. Corder (1981) agrees with Klein that that linguistic system acquire by the students in their childhood simplify or complicate the learning of foreign language. Corder adds that any comparison between the two systems can help in finding the keys to help students acquire the new language easily. It is important to consider Corder's advises in finding the keys to help students overcome the difficulties, because as Larruy (2003) says " the weakness of the contrastive theory in explaining the linguistic side of the language acquisition does not help students in appropriating the errors".

In the chart below, we are trying to show the differences between the French and English systems, these differences, as previously noted, caused the students to do negative transfer "errors" during the process of learning the French. This chart was pulled from online source which we find easy to follow.



# Major Differences Between French and English Grammar

Verb Differences						
Three Past Tenses	Future and Conditional Tenses	<b>Reflexive Verbs</b>	Subjunctive Tense			
Imparfait: Events that occurred repeatedly or to "set the scene" Passé Composé: For specific events that took place at a specific time Passé Simple: For formal written writing	French has its own future and conditional tenses This means French doesn't use helping verbs like "will" to signify the future in a sentence like "I will go".	In English, it is not necessary to repeat the pronoun when something is performing an action on itself ("I brush my In French, the reflexive pronoun is required. (E.g. <i>Je me brosse les dents</i> , meaning "I myself", or "I, me brush the teeth.")	A mood for sentences implying wishes or uncertainty or obligation, and similar variations Exists to a much greater extent in French than in English and must be used and recognized			
Other Differences						
Nouns and Adjectives		<u>Pronouns</u>				
Every noun is masculine or feminine and singular or plural, and adjectives must match the nouns in both areas		Indirect and direct object pronouns go before the verb, not after				
Adjectives usually go after nouns instead of before		A plural "you" exists and also serves as a polite way to address a single person				
			© 2015 TheFrenchPost.com			

In the process of learning French as foreign language, learners find that some cues are easier to pick up than others, such as which consonants are common in starting and ending words. An example is the "z" sound, which is a common end to words in English but is not often found at the beginning of words. Other cues, such as intonation, are harder to master and are more likely to be influenced by a speaker's native language. Tremblay points to English where a stressed syllable is a strong indication that a new word is beginning. But in French the opposite is true; prominent syllables tend to be at the end of words. An example of confusion is the French phrase for cranky cat, which in French is "chat grincheux." For a brief second, the phrase can sound like the English pronunciation for "chagrin," a word with French origins. If we also consider that French language give importance to the gender of words, where English does not treat words based on gender, we notify that this cause problems to americans students because they have to learn the gender of each french word. Then, they also have to agree the adjectives with the nous and these adjectives should also agree with the noun gender.

This research paper is an introduction for a longer research that help in examining the differences between two languages in an effort to identify problem areas for language learners. The identification of positive and negative transfer meant that a detailed examination of the two languages needed to be undertaken to point out where students would have problems. By examining the languages and identifying the problem areas, educators could then predict the elements of negative transfer and drill these elements to form the "correct" habit.

After analyzing the error system and showed few examples, we would like to offer few dimensions that we find it is so valuable to consider. 1) Propensity: The learner must feel the need to learn the language. Propensity covers the totality of factors that induce the learner to do it, e.g. social integration, communicative needs, attitude, education & promotion. 2) Access: The learner must have sufficient access to samples of the French language. The language processor cannot operate without a) language input, and b) opportunities for communication. 3) The structure of the process: The learner must acquire a solid body of knowledge in several interrelated domains, e.g. phonological, morphological, syntactic, lexical knowledge. Each successive stage of learning requires the maintenance of a delicate balance among the elements of these domains. With the transition from each stage the learner must establish a new balance.


We also like to offer few Solutions that might be the keys for students to overcome the errors and simplify learning: 1) Educational system: Teachers and students should be provided with better material and textbooks that simplify the learning and point out the problem of interferences. Existed materials lack of any clarification to the problem. 2) Teachers: The teacher is the monitor inside the classroom and All French teachers in American institutions know English very well (natives and foreigner), they should draw the attention of the students to the similarities and interferences between the two languages. 3) Students: Students should follow established rules to overcome the problem in the first three stages of the learning. They should also recognize that there are interferences between the two languages.

## CONCLUSION

The native language of our students caused them obstacles in the process of learning the French language. The French language system is far from the English language system, therefor negative transfer happens in many tasks of learning. The examples given in this paper show how the mother tongue of our learners play an important role in acquiring the french language. The mistakes found in student's papers are Interferences which due to negative transfer or negligence to the foreign language system, so we think it is an easy problem to fix. With more attention and focusing on rules, problems will be solves and less mistakes will be made.

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# Language Education and National Identity: Language Reform Movements for Strengthening National Identity in Hungary

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# ABSTRACT

Introducing the modern concept of nation for the first time in the 18<sup>th</sup> century, a German Philosopher J. G. Herder argued that "the Hungarian language will perish in the waves of the German and Slavic languages." This indicates that language education is closely related to national identity in a nation. Stimulated by his warning, the Hungarian people conducted language reform movements under the leadership of Kazincy Ferenc from the late 18<sup>th</sup> century through the 19<sup>th</sup> century. In this regard, they focused on the reform and education of the Hungarian language reform and education will address the development, process and results of the Hungarians' language reform and education to boost

their national identity.

## INTRODUCTION

Language is an important medium for humans to lead a collective life. First, "nation" could be referred to as a representative language-using group (Doo-bin Im, 2011, p.231). The group is generally characterized by sharing language and history together. This makes the members of a nation form their own identity. As a result, the language and identity of a nation are closely related to one another. As seen in the world history, a ruling nation has often forbidden its subject people from using their own language. Japan prohibited Korean people from using Korean language in 1937. Joseph II, a Hapsburg emperor, banned the Hungarians from using Hungarian in 1784. Such policy was caused by the recognition that mother tongue is closely associated with national identity. Accordingly, the ban was considered to be an effective tool for collapsing national identity. In return, a subjugated people have striven to protect their mother tongue for the purpose of maintaining their identity. This is true of the Hungarian nation as well. Introducing the modern concept of nation for the first time, a German Philosopher J.G.Herder argued that "Hungarian might be swept away by the waves of German and Slavic languages" (Sang-hyup Lee, 1996, p.183). This indicates that language education and national identity have a close relation to one another. Warned by Herder, the Hungarians conducted language reform movements under the leadership of Kazincy Ferenc from the late 18th century through the 19th century. The movements focused on the reform and education of the Hungarian language. This presentation will look into the language reform for the reinforcement of Hungarian national identity.

## BACKGROUND AND BEGINNING OF LANGUAGE REFORM MOVEMENTS IN HUNGARY

In Hungary. a language reform campaign was carried out by Kazincy Ferenc systematically and in earnest, but could date back to Bessenyei György. In 1784, Emperor Joseph II ordered that German should be used officially in Hungary as well. Against the policy, Bessenyei György joined the magyar jakobinus mozgalom, an independence movement group in Hungary. In a propaganda "magyarság", he maintained that "everyone can be an intellectual by mother tongue only". In an open letter in 1781, he argued that "learning is the most important tool for national prosperity and its key is language" (Kyung-min Han, 2004, pp.131-132). He saw through the Hapsburgs' intention to dilute Hungarian identity and incorporate the Hungarians into the Hapsburg Empire by prohibiting them from using Hungarian, and made efforts to protect and develop his mother tongue. Herder also said, "The characteristics of every nation date back to prehistoric times and national spirit is included in language, fork tales, folk songs and custom. Hungarian might be swept away by the waves of German and Slavic languages". This provoked the Hungarian people to protect and develop Hungarian on a full scale. This movement was initiated by a reformist Kazincy Ferenc (Sang-hyup Lee, 1996, p.184). In the process of language reform, there were intense clashes between ortológusoks and neológusoks, but the latter won the victory in the end, causing a great change in Hungarian (Péter László, 1994, p.1497). The reform of neológusoks is rooted in the sense of crisis that the then Hungarian seriously lacks not only common vocabulary but also learning-related vocabulary and may be absorbed into German and Slavic languages.



Department of Hungarian Language and Literature was opened at the University of Budapest in 1792; most academic papers were written in Hungarian. In 1844, the Parliament enacted a law that made it obligatory to write all official documents in Hungarian, and Hungarian was recognized as an official language (Sang-hyup Lee, 1996, p.184).

## DIRECTIONS OF LANGUAGE REFORM AND EDUCATION IN HUNGARY

In Hungary, language reform was directed toward the recovery of lost vocabulary, the reception of foreign language vocabulary, and the expansion of the then vocabulary. The reform was to make Hungarian the official language by expanding and educating Hungarian vocabulary among the people in three ways (Minya Károly, 2003, P.11).

The Hungarian nation is very peculiar in that its origin and history are defined by language. Calling themselves magyar, they have lived in a blood mixture with other peoples, while migrating from the western part of the Ural Mountains to Europe for thousands of years. This makes only Hungarian an element of defining the Hungarian people. In other words, the Hungarian nation is closely related to linguistic hypothesis in origin and history. Hungarian ancestors lived among the Finn-Ugric primitive language community to the west of the Ural Mountains, but were separated from the peoples of Finn languages who moved to the northwest. The magyar people moved to the southwest, lived with peoples in Central Asia, Turkey etc to the south of Siberia, and then moved to the center of Europe. They settled down in the current region of the Carpathians and lived as Europeans (Soo-young Park, 2016, p.22). While migrating thousands of years, they borrowed vocabulary from neighboring peoples, while losing a large number of Finn-Ugric primitive language vocabulary. Paying attention to the problem, language reformists did their best to their national identity derived from Asia and recover the primitive vocabulary of the Hungarian people. In the 19th century when language reform movements began in earnest, it was one of important duties for the Hungarian nation under the Hapsburgs to find their roots and establish their national identity. Specifically, primitive words, such as aggastyán (old person), alak (form), év (year), fegyelem (training), hölgy (lady), lomb (leaf), rege (story), szobor (sculpture), terem (hall, room), vihar (storm), verseny (contest, game), were brought to light again. In addition to these common nouns, proper nouns were also found again. Of them, human names, Árpád, Ákos, Béla, Gyula, Zoltán etc. are often used as human names. Besides. several words, which remained dialects, were incorporated into standard language. Their examples are barangol (wander), betyár (bandit, bucka (low hill), burgonya (potato), csökönyös (obstinate), csuk (close), érdes (coarse), falánk (greedy), góc (integration, center), hanyag (lazy), hullám (wave), hűs (cool), idom (diagram), inda (vine), kamat (interest), kandalló (fire pot), kelegye (marriage expenses), laza (loose), lenge (very light), modor (attitude, behavior), pogyász (luggage), rimánkodik (implore, entreat), róna (plain), szikár (haggard), etc. (Bárczi Géza-Benkő Loránd-Berrár Jolán, 1967, pp.551-552).

The Hungarian language has been culturally influenced by the settlement in the Karpaten Basin after long migration, the establishment of the Hungarian Kingdom, and the subsequent contact with various nations, which is represented by the borrowed words in Hungarian. Accordingly, the loanwords show how the Hungarians were influenced economically and culturally during the ethnic movement (Soo-young Park, 2016: 32). Even before the language reform, the Hungarian people borrowed many foreign words, while moving from Asia to Europe. For example, they adopted words, such as tej (milk) and tehén (ox, cow), while keeping in contact with ancient Iranians after separation form the Ugric community. Besides, they got in touch with the Turkish people most among the peoples from their early migration through the settlement in the current territory. The contact led to the reception of Turkish words, such as alma (apple) and kapu (gate). Reaching the Karpaten Basin, the Hungarians encountered the Slavic peoples for the first time, which led to the borrowing of more than 500 words, including görög (Greece) and lengyel (Poland). As the Mongolians invaded Europe in the 13th century, the Germans moved into Hungary. More than 2000 words, including orbély (barber), cukor (sugar) and marha (ox, cow), were adopted from then through the times of the Hapsburgs. In the Middle Ages, Latin was the official language, which led to the adoption of many Latin words, including angyal (angel) and iskola (school), in the areas of school, learning and religion. In the Renaissance Age, the Renaissance culture was introduced from Italy and King Mátyás married a lady from Italy, which led to the borrowing of many Italian words, including mazsola (dry grape), forint (Hungarian currency) and narancs (orange)(for further information, see Soo-young Park, 2016: 32-41). Noting that many foreign words were received during migration and settlement in Europe, language reformists increased Hungarian vocabulary by adopting foreign vocabulary intentionally. For example, they adopted pillér (pier) from French and bálna (whale) from Latin. In Hungarian style, they also translated the foreign words not found in



Hungarian. For example, anyag (material) and pincér (waiter) were derived form materia and keller, respectively. This adoption made Hungarian rich in vocabulary.

Language reformists intentionally expansively reproduced Hungarian vocabulary by restoring vanished Finn-Ugric vocabulary, borrowing foreign vocabulary, and composing, abbreviating and deriving the existing Hungarian vocabulary. In terms of composition, they composed nő (woman) and vér (blood) into a new word nővér (sister); szem (eye) and üveg (glass) into szemüveg (spectacles); folyó (flow) and irat (writing) into folyóirat (magazine); rend (order) and őr (guard) into rendőr (police); vér (blood) and szegény (lack) into vérszegény (anemia). In terms of abbreviation, they created árny (spirit) by contracting árnyék (shade), and kapa (pickax) by contracting kapál (to pickax). In terms of derivation, they created many new words by adding derivative endings, such as ász/ész, z, kodik/kedik/ködik, ít, alom/elem, mány/mény, vány/vény, and da/de to the existing Hungarian words.

### CONCLUSIONS

Performed from the 18th century through the 19th century in Hungary, language reform and education were revolutionary measures for national survival in the sense of crisis that Hungarian, enclaved in Europe, might be expelled by neighboring Germanic and Slavic languages. Being intentional and revolutionary, the language reform also sparked formidable resistance from opposite groups. Nonetheless, language reformists recognized that if mother tongue disappears, it is difficult to keep national identity, since mother tongue shows national identity best. Therefore, they believed that they had to pretend Hungarian, above all, by expansively reproducing its vocabulary. At that time, Latin and German were official languages in Hungary. Disregarded by intellectuals, Hungarian was poor in vocabulary. The Hungarian people could begin to innovate their mother tongue thanks to Herder who reminded them of the close relations between language and national identity.

In Hungary, language reform focused on the expansion of vocabulary in three ways. In terms of national identity, primitive Finno-Ugric words were restored to reconfirm and strengthen the Asian identity that gradually disappeared in oblivion. As hundreds of years passed after the settlement in Europe, the Hungarians were Europeanized in terms of material culture, but their self-portrait and portrait were still based on Asia. Hence, Asian elements were the most striking features that differentiate the Hungarians from the Europeans. Lost primitive Finno-Ugric vocabulary were restored to strengthen such distinctive features. Second, the adoption of foreign vocabulary could be understood in terms of reconciliation for coexistence with neighboring nations. However, it could be understood seen in terms of the reception of part of European culture rather than the reinforcement of identity as Europeans. Lastly, the expansive reproduction of European culture. Specifically, the expansive reproduction of European culture. Specifically, the expansive reproduction of words from Finno-Ugric languages was to solidify Asian identity, and that of loanwords after the settlement in Europe was to strengthen European culture. Therefore, language reform movements in Hungary were implemented both to strengthen Asian identity and to seek harmony with Europe by the expansion of vocabulary.

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# Learning Design by Design Experience

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## ABSTRACT

Project design verve: this is the key concept on which the experience in project design pedagogy of the Milan Polytechnic Design School (Italy) is focused in the field of research and training. It is also the key concept that this paper wishes to summarize and formalize in terms of results and intuitions.

The theoretical and methodological evolution of industrial design project is shaped by cultural, economic and social framework.

The paper will analyze issues related to design project pedagogy in an economic context that interests universities, large corporations and international companies, researched through a survey on the new figure of the designer in the era of the information society and through a wide range of case studies, true evidence of project experience in training.

The main purpose of this paper is therefore to indicate pedagogical guidelines for the university project that will help fine-tune the student's training path, seen as a real experiential path, whilst at the same time demonstrating the need and the effectiveness of this kind of path.

Four main topics are examined and investigated: cognitive processes, the new figure of the designer, new products and intangible goods and finally tools and experience in project design pedagogy.

#### **COGNITIVE PROCESSES**

The starting point refers to learning systems of project pedagogy, its schemes and experiences that need to be transferred during the course of training. If you consider the extended and complex course that one has to follow to learn how to "articulate a project" according to a pre-defined and sequential process you'll can or even need to split the problem into different parts to manage simpler arguments and solve it. You could even state that educational experience today takes on a typical itinerant connotation, in the different phases of "nomadic learning", with the aim of an actual inter-disciplinary experience, designed to develop an awareness of what it means to be a project designer and to provide a set of appropriate tools for the "project design". The idea is to start a standardization process for "a pragmatic educational proposal aimed at the training of young project designers who would operate in an industrial society characterized by strong innovative trends": the goal is to focus on an appropriate environment from which to learn, within which direct comparison has a fundamental role. Which characteristics must it hold? Which resources must be made available?

The most pressing point is how to provide the necessary tools to refine the training process of emerging professional figures, making them capable of adequately responding to the job market needs. What is required is a response to the question of cross-ability, of "integrated" project design, especially when production and demand models at this point appear strongly oriented to the development and the evolution of the "soft" components (from this seems the need to elaborate the needed skills till the design of services) juxtaposed to the "hard" components of products.

A possible method we could study and develop could foresee:

1. a first introductory level on project pedagogy, tendencies and methods;

2. a second level based on a pedagogical training program aimed at project oriented students, researchers, and faculty who are following a mixed experience training course with internal and external workshops, meet- ings, classroom time, dedicated project design courses, etc;

3. a third level aimed at defining tools and methods of the sequence be- tween structured design and continuous and discontinuous project design as a basis for a full immersion experience for achieving project design ability.

The above develops within the different chapters in a critical reading articulated in various complementary standpoints;

- Different theories on learning processes covering emotions, location, learning, skills, training and research;

- structural design pedagogy; interaction between the academic world and the real world;
- theories, methods, techniques, procedures and project tools for the industrial product which focus on its production, technological, build, it functional, formal and use characteristics, as well as on the relationships it establishes with its spatial and environmental context and with the industrial and market context;
- a professional approach to the topic of didactics applied to a model of continuous and discontinuous project design;
- "receptive & responsive" firms, market conditions and human resources employed;
- exploring the different levels which comprise a whole (but at the same time a complex structure) which can be read in the rapport between project pedagogy and project design experience. The course of study is studded with acronyms and key words which present synthetically the fundamental concepts of this monograph. It is aimed at verifying the proposed learning process using graphs, diagrams and flow charts with the objective of standardizing some methodological and experiential points.

The proposed idea is integrated with a program on the whole project sequence through project experiences and research carried out within the university. There is an observation related to real teaching experience: the project pedagogy in a Design School surfaces the idea of a vital and dynamic institute, active on almost all the front lines of "project development" and strongly integrated with the world of production and the economy; nevertheless at the same time it becomes evident that -and it is a stimulus for our future- the continued existence of areas of training not sufficiently developed and of opportunities only partially dedicated to project design.

The university has by definition a wealth of experience and knowledge, continuously increased and deepened by researches, collaborations with firms, degree and doctoral thesis, applied research projects on behalf of firms, Institutions and National Councils. All this represents an inexhaustible source of novel and analytical project design offerings, specialized, formalized and scientifically accredited programs, and novel scientific and planning contributions to projects covering general or specialized topics. This wealth, besides generating different types of projects and research approaches, is being formalized in bibliographies and publications, by University faculty or associated Universities, maintained and shared in archives, libraries and data bases, available on-line: everything is therefore organized in a veritable network of competencies. Moreover, the university constitutes a permanent observatory of innovation and development processes, of product/services development, therefore, fully responding to the demands of product innovation by the firms. The above is feasible because of the theoretical and applied research activities typical of the academic world more directly, in comparison to the business world, first among all, the activities stimulated by the advanced competition workshop, and the in house workshops, up to the post-degree programs (university level Masters). The formalized wealth of analytical and innovative offerings in the various areas is one of the structural pivot points of the university's essence. This complementary standing towards the firms' strategies could draw the firms toward the university with their direct involvement in the curricular pedagogical initiatives of the Industrial Design degree program. What can the learning environment be like in project pedagogy? In the general concept, an efficient classroom is one with whitewashed walls, new desks, and perhaps even a video projector. Often in fact, the characteristics that dictate an individual's well being and directly influence his learning ability are ignored. In planning the learning environment, both the elements that predispose a human being to learning and those that stimulate learning must be taken into consideration", The human organism is in fact sensitive to the various factors that influence its sense of well being and consequently the proper and efficient production level of the human "bio-machine". In creating a microclimate that reproduces the optimal conditions for such an objective in a closed environment, it is therefore necessary to monitor factors such as temperature, humidity, air purity, direct sun light, air conditioning and artificial lighting.



Specifically, the argument for air conditioning is essential for guaranteeing a proper relationship between environment and individual. In creating an ideal microenvironment, the proper use of artificial lighting and its potential fusion with natural sun light are important, since every type of light radiation - and specifically artificial light, often unfiltered and poorly regulated, contributes to eye fatigue and stress on the optical nerve. On the other hand, solar radiation carries perception and climate modifications that can be especially discomforting. It is in fact necessary, in order to circumvent external stress and favor maximum concentration on the part of the individual, to prevent the individual from wasting his energies in continuously readjusting his own correct breathing, perspiration and thermo regulation rates as well as the other needs carried out by his own basal metabolism.

It would certainly be interesting to see intelligent solutions adapted from the most recent studies in domotics and the use of state of the art materials and technologies for automatic regulation while, at the same time, having the ability to personalize the microclimate control installed in a design university! Among the most recent trends, as far as ergonomics and an area predisposing to concentration in the work and study environments are concerned, the importance of flexibility emerges both in the work area and in the surrounding environment: in essence, flexibility is the possibility to adapt to the needs of the user, with reference to seating, light sources, bearing surfaces, etc.

The well being of the individual can, in fact, derive not only from the ability to personalize the quality and the quantity of light flux in his own environment, but also from being able to reconfigure space in both physical and functional terms. New technologies and the development of new communication devices can not only perfectly meet the demands of the microclimate and environmental control, but also further constitute a stimulus for learning. The idea arises from entertainment and show business schemes: transferring emotional content or provoking feelings and emotions that go along with the concepts by stimulating the imagination, and therefore, one's interest in order to guarantee recall and processing of the information received. In an environment in which the student must learn several roles and skills, learning can happen even by participating in game-like activities, by recreating environments and circumstances: consider the possibility of "acting out" skills and work situations or new possible scenarios by showing short films.

In fact, it can not be forgotten that, besides the educational activities, more or less "reinvented" according to the principles of entertainment or following the experiential path model the esthetic perception, through the choice of materials, shapes and colors, can also generate a positive attitude and influence the ability of "knowing how to be" and therefore of "knowing how to do", which is the greatest "subjective" stimulus for the students (and faculty!) of a project design university to absorb and develop their own "project design verve".

## THE NEW FIGURE OF THE DESIGNER

The design profession embraces an extremely vast field of project design issues, although the whole universe of industrial products does not fall in this field. The job of the designer is mainly aimed at those products with which man establishes a direct, perceptive and operational relationship. A designer's activity should be in continuous development and definition, but also dedicated to the ongoing discovery of new application fields. In fact, many agree that the designer, besides defining the shape of industrial products, should also take on the ongoing role of "researcher, innovator and assembler of different technologies" evolving methods compatibly with the socio-economic as well as the industrial situations. Castiglioni states that it would be ideal for the designer to live in a "design community" that includes the producer, his organizations and the project designer, in order to appropriately define the new product definition program together. Only this way would it be possible for the designer to take part in all those choices which would otherwise be defined by other professional figures (coming from the sectors of marketing, finance, etc.), leaving little room for his own ideas.

Another important factor for the designer is the awareness that he is delivering a service to the user of the created product, trying to meet the user's expectations, even the latent ones, and defining products that offer good quality and excellent performance. In Zanuso's view, the contemporary designer must take on a role similar to that of a movie producer, in order to interpret the object as he conceived it and how he plans to communicate it.

A true producer because the resources, the people and the equipment dedicated to the project are so many, complex and differentiated that he cannot be a specialist in all of these activities and yet he must know them well enough to be able to coordinate them. The quality of the environment, of goods and hence of life itself become relevant only for purely esthetic reasons. The designer's role thus becomes taking on a creative stance in the definition of the process/ product, a definition more in line with the prospect of sustainable development": most of all more coherent in terms of project-related choices he will have to define not only for the product's life-cycle within the industry but also for its life cycle within the social and environmental framework.

Some industries have a production cycle that starts out from the specific and proceeds with slow and complex processes in which the designer can take action on the specific product to be designed right from the beginning. Other industries don't have a clear idea of the product they want to produce and therefore, here too, the designer can start from scratch but, compared to the previous situation, he needs to adopt a different attitude, i.e. with a stronger role. If the designer is "born" in the company he acquires a certain style and way of interpreting the production reality, but if -as is the case most of the time- the designer "comes" from the places of education, creating a cultural and design oriented affinity becomes a necessity. The relationship with the commissioning party is a rather important aspect and will change depending on whether it is private or public and on the size of the entrepreneurial reality in which the designer will take part.

In this sense a design pedagogy that adheres closely to the world of companies and private and public institutions similar to the one we are proposing and describing can be considered very close to an ideal model. In this regard it would be useful to conduct an interpretational verification of "structured" design intended as a new project design management practice aimed at acting on all stages of the production process (from marketing to concept development, from the executive of project design to production, from communication to the product's launch on the after-sales market). In large companies, this type of action is present in the project design areas to provide an answer to the increased turbulence and complexity of markets: it is a type of organizational approach that adopted techniques and methods typical of product design transposing them on a wider plane with several tiers until a real change in the organization of the company is determined. As fare as "structured" design activities are concerned, one could therefore visualize the beginnings of a systematization process for the development and the observation of training processes focused on project design pedagogy. As fare as "structured" design activities are concerned, one could therefore visualize the beginnings of a systematization process for the development and the observation of training processes focused on project design pedagogy. The exploration relates to the organization of project development processes and to the possibility of integrating this organization with training actions that are compatible with the pedagogical product administration sequence. Looking at the most advanced control techniques of the initial stages of planning, in a framework characterized by growing turbulence, complexity and competitivity such as the present one, we might see increasingly flexible project models take hold; models in which the concept is left "open" or frozen and progressively adapted once new information on technologies, prototypes, market needs is acquired. Advanced use of decisional aids and of means of support for the development of virtual prototypes, for project methodologies and for technological process management (professional and management software and Internet/Intranet systems for the management and exchange of knowledge) can also be encountered. All with significantly increased opportunities and a relevant reduction in market response times.

The challenge of the industry in terms of competition and market control is based precisely of the development of IT. In particular, the development of Internet has had an impact on the value chain and on the structure of the sectors, making it, for example, possible to improve the supply of raw materials and semi-finished goods, to manage contracts and logistics more efficiently and to deem outsourcing for the management of certain processes convenient. The large company nevertheless maintains strict control over the phases of planning and commercialization, that is the overall management of the production sequence: and it is precisely in the field of basic and applied research and of the management of production processes that the experiments for an ever more advanced project pedagogy need to be verified. By this we mean a project pedagogy capable of providing the student with "experiential" training content, in line with the most advanced training techniques, in which the student learns the value of "self-training" and of "knowing how to be" a designer by immersing himself in the appropriate dimension.

Although no definitive position exists as yet, one should consider that the designer must report directly to *management* and not to the internal designer or the *marketing* department. Only in this way can the designer have an idea of the product as the image of the industry in global terms. His relationships should always be at very high levels of the corporate hierarchy so that the true substance of the project underway can be dealt with. Assigning the designer an important organizational role within the company should also be a widespread practice, allowing him to act as a catalyzer, a bridge or interface between the various functions; organizations with rigid and formalized hierarchies rarely seem to be able to take advantage of this type of competency.

In the project design function's view, the project has no error and the entire responsibility for defects should be attributed to production. Defining the area of compatibility between the philosophical matrix of the transcendent idea of the concept of quality, strongly related to the profession of the designer, and the technical matrix of quality measurable in scientific terms, typical of the project designer, would seem to be a necessity. Defining the elements that might be able to unify and to uniform these same terms in a single matrix defining a new role for the industrial designer is the challenge, the goal project pedagogy sets out to pursue. So, one of the goals the Project University should strongly pursue is tracing the outlines of this single matrix, that is rewriting the organizational system focusing on an interdisciplinary approach to the different functions and on the different roles so that an industrial product can be better defined. The nature of the project, not only in the field of industrial product design, today as much as yesterday, still has its point of reference in a highly intellectual activity that is separate from the work processes of material execution. Often this activity tends to be organized according to "processes that divide the tasks within the project design process itself. One of the possibilities, perhaps the most widespread today, is to foresee the appointment of a person in charge of the project who, supported by a team, takes on the responsibility of developing a global work plan, from the first idea to the release of the industrial product and whose task is to keep the dialogue between the various functions open so as to guarantee the uniform and integrated management of the entire process. This however would be a role with absolute powers in developing a new product; a role whose introduction might create quite a few problems, creating friction with the current structure, due to its transversal character. At present, as we mentioned earlier, the figure of the designer in the industry has a "vertical" coordination role that only partially entails a sort of inter-functionality. It is for this reason that experimentation of a new type of project pedagogy is carried out in agreement with the companies themselves and this training opportunity generates a project culture that the company itself, teachers, trainers and students can share as a wealth of experience. This new transversal management, besides prompting the "creation of order" makes the designer take over management of the project as a whole, from the initial concept of the product to its stabilization in production terms to its launch on the market, constantly verifying that all the pre-established objectives are being reached. The activities of this new "industrial designer" should carry out are many and include planning development, activities, defining decision moments; in general, the management of all the stages of development should be the competence of this new figure, while the moments of passage from one stage to the next, which always require precise and determined decisions, are evaluated by the management on the basis of the indications of the designer himself, whose opinion is thus fundamental.

An industrial designer can, in this sense play, a significant and influential role on the organization of development processes and consequently on the organization of the entire company for which he works; this "merging of the functions of project coordination and decisive defense of the initial concept in one single person, capable of dealing with the situation, is, in fact, a strategy that proves to be effective in satisfying diversified expectations, among which those of the end users of the industrial product". To draw a clearer picture of the actual functions of the contemporary designer, we can give an overview of the fundamental characteristics of his activity. First of all, he takes responsibility for the coordination of the project in all its different stages, *from the product's creation to its release:* in order to manage development correctly and efficiently he should therefore be very knowledgeable about the production process, a knowledge that can be obtained with good training (which, according to the thesis set out in this book, should take the form of a real "experience" involving theory and practice) and direct contact with project designers and technicians; besides coordinating the functions he will also take responsibility for defining the idea of the initial project, guaranteeing compliance in the more technical phase as well.



To these characteristics we can add the responsibility of choosing the main components of the product and successfully meeting specific criteria (which include, among others, planning, production, marketing) and objectives of time, cost and quality. Some of these activities appear extremely significant in highlighting the complexity of the role of the designer! In fact, if applied, they reinforce what some designers said right after the Second World War regarding the role of the designer and how he can qualify this role.

## NEW PRODUCTS AND INTANGIBLE GOODS

In a market saturated with similar, and today, technologically advanced products, which comprises a strong discriminating factor is the design and service components. This is valid both for a television set as well as for toothpaste. Presently, the ability to conceive a product in its entirety, adding straight away to its ingredients in the mix, as an alchemist would, the added value of communications and services, is what is asked of designers today to answer the demands of the market both efficiently and with a profit.

The challenge is therefore in the ability of the academic world to adapt to this demand, of who is asked to create a model or course of training capable of interacting "in real time" with the real world, meaning firms, hence with an exchange of culture, resources and professionalism.

The hypothesis presented and the one on which we will carry out a feasibility study, revolves around the need for a potential style standard in the training proposal for a project pedagogy more appropriate to the socio-economic system in which we live, and therefore, it is necessary to start a powerful action to redefine the training methodologies of project design.

This could be referred to "complex training experiences". Such experiences are known and in use but only in an embryonic and spontaneous state? and the student is not always at the center of this experience. For example we can consider the effort undertaken in the last few years of those who have strongly integrated this process at the university level and within its Partnerships.

Without a doubt, a "mixed" training experience, or one capable of reproducing an experiential context analogous to the "apprenticeship", would allow the student to benefit from an effective and professional training for a highly competitive market.

Project pedagogy, is by its own nature, difficult to trace back to predefined schemes. On the other hand, designing a product today more than before also means designing the best way to produce it . And it will be with the very learning of technique and development of awareness that the future designer will feel at ease with any project brief, as a serious and prepared musician is capable of improvising on any type of score: with this metaphor we can now introduce the concept of project design "verve" which we will look into in more detail below.

What counts here is therefore not merely developing a definite method which could answer efficiently the project design logics: what is required is to develop through "mixed experiences" the potential of sensorial and experiential models. These stages require, and properly so, more detailed study of the issues and various experiences in different places and environments and with tools sup- plied ad hoc for every stage of the experience. The "red connecting thread" is the development process of industrial products, to which we will apply a set of tools and intangible values which each student and professor will choose together.

This model has already found practical applications in university training courses, due to the spirit and involvement of several colleagues of mine, but needs to be "standardized", and as such it needs to be acknowledged and adopted. In fact, it is now possible to state that concreteness, proximity and practicability are elements that can offer a competent model of learning and a valid support to the firms as far as pedagogical experimentation or applied research is concerned.

The objective is therefore the definition of a project pedagogy depending on a symbiotic relationship between university and firm: the common interest revolves around the project and it is the task of both partners to favor the development of a project design culture.

The university is thus becoming a location of encounter and exchange, where propaedeutic activities are cultivated for the project: activities that are a natural extension of and complement the firm, where the project materializes in the production process. We can therefore wish that both parties will define together the meta-project-design components through participation and appreciation of university careers (including non tenure track professors, tutors, doctoral students and research funds). We also wish that laboratory experience, and involvement in project design could become more frequent as well as an integral part of the design educational process.

#### TOOLS AND EXPERIENCE IN PROJECT DESIGN PEDAGOGY

Contemporary design expertise should include technical and economic knowledge of materials, technology, development tendencies and consumer trends. Project pedagogy should therefore focus not so much on the finished product but on the ability required of the designer to manage such a complex series of languages and information, and hence from this be able to define a creative solution. At this point we must specify that "creativity" is not at all a synonym for "artistic" ... the artist's gift finds its equivalent in the so-called "project design verve" of the designer; a creative solution appears to be the best answer for evincing the shape and function of an object but it must also incorporate the best way of producing it! So the designer should be gifted with unusual qualities that can only be acquired through broad training in production processes and in the environment in which he or she lives and works paying special attention to economic, cultural and sociological issues. From this point of view, the Italian school and university meet European standards, but only if you take into account the most recent efforts made in the project design course of training (no longer subordinate to theoretical training) and that the educational contents are in line with the demands of the work world.

Draftsmanship is only a designer's means, not an end: pedagogical attention should be placed on the project design process, arousing interest in every aspect of the design process -technical preparation but also human sensitivity- which revolves around it and is complementary to it. The dignity of a project depends on its cultural background. To all that has been said up to now, Trabucco adds that for the project designer, the level of importance of doing is more meaningful than that of talk, where theory springs from project action as in the practice teacher's studio involving the students in his work and providing them with interpretative and critically defined and safe archetypes and processed language structures. Reproduction on a larger scale of this ideal teacher/student relationship means therefore, that the "action" of project design training implies training in various circumstances and different moments, that is in the classroom, departments, seminars, laboratories and conferences on project planning, in the firms (internships, workshops, etc.). According to Gasparini, available time for project pedagogy, due to the subject's complexity, is not adequate for learning that can therefore only be completed through simulations; these are only substitutes: learning experiences can be complete and definite only for a real and specific purpose, only if it takes place within a real firm and provides for learning how to use and understand its means and resources. This is therefore the meaning of "residential workshops", thanks to which the would-be designer learns to come into contact with different realities, skills, means and resources and to prepare on these bases, and according to the project's needs, a common language among the designer, the firm, and the project team members: this is a very efficient method that however should be formalized and become normal practice in every project design school. Therefore, notwithstanding great progress in the learning structure and organization of university teaching, theories and methods covering it are presently of a varied nature and still far from being formally recognized. As stated by Trabucco, this depends greatly on the fact that, at the beginning. This' is therefore 'the meaning of "residential" workshops"; thanks to which the would-be designer learns to come into contact with different realities, skills means and resources and to prepare on these bases, and according to the project's needs, a common language among the designer, the firm, and the project team members: this is a very efficient method that however should be formalized and become normal practice in every project design school.



Therefore, the question is how to organize courses and laboratories to find a solution to the lack of individual relations within present university structures, that is, within environments where review and feedback have an important role for one's training development: What must its characteristics be? Which resources should be available? A solution could be starting educational programs that go beyond the normal conception of the course of training. To break the schemes here literally means going beyond the four walls of the university classroom and adopting new educational experience modules. Furthermore, project design practice itself often requires breaking out of predesigned methods and even if we could classify and reorganize the existing systems, we could not identify time and again a unique and recognizable one that could lead to the definitive characterization of an object: the actual definition of the object sometimes arises from the ability to venture onto the semi-virgin grounds of typological sedimentation, but also, on the other hand, from a series of specialized notions that go well beyond the simple and easy definition of the form-function relationship. We should remember that we need good knowledge of existing and new materials, of the specific skills needed in relation to function and costs, and that we also need to be acquainted with transformation and production technologies, because drawing an object means also planning the most suitable production sequence. The objective is not only to develop a suitable method effectively adherent to project pedagogy. In fact we should develop the students' potential with "extraordinary" models through integrated experiences: stages that require various in depth thematic research projects, in different locations and with ad hoc instruments (a set of tools which has to be prepared for student and teacher alike). The connecting red thread is the development process of the industrial products, the set of tools and the intangible values of the balance sheets. Sharing and circulating such values as knowledge and experience are fundamental for the production of a good (material or informational) and the success of the firm producing it, especially when these "soft" elements are reflected in the product, in which, according to the current trend, service or communication components are acquiring greater relevance than the "hard" ones. The training effort must therefore be aimed at developing professional skills throughout the course of training and whenever possible through practical experience in the field. Developing the student's potential in order to transfer project design skills calls for reference theories on pedagogy, learning and method.

Developing the student's potential in order to transfer project design skills calls for reference theories on pedagogy, learning and method». Presently, two models are used: the first one, psychological, of the McClelland-Boyatzis school, based on organizational behaviors, abilities and attitudes; and the rational method, of the Prahalad and Hamelf school, based on professional know-how. The first model (psychological) ignores any professional knowledge, basing its approach on the behavioral analysis of the best performer. This method shows that in the past a number of behaviors had been successful, but cannot at all foresee that this pattern will continue in the future. In this approach therefore, the process of defining competencies stands on past events. The second model (rational), on the other hand, examines professional knowhow, basing its approach on the identification of skills necessary to favor the *empowerment* and its critical factors of success, both current and in the future projection. The process is centered on developing the professional skills needed to maintain/acquire leadership. The advantage of this second method is evident, in terms of connections to project pedagogy schemes and of the anticipation of the need for a new and different knowledge base aimed at developing professional skills and supporting the corresponding strategy. Nevertheless, its weak point derives from not considering the soft side, that is to say, the personal qualities, the cultural background, the broader vision of problems related to the project, the very attitude towards the project: this is how we can describe the designer's "project design verve" that certainly influences his or her individual role. The new model submitted, as far as the project designer is concerned, goes beyond this weakness, joining both facets, and thus integrating professional skills, individual qualities and expertise, both on a personal level and on a learning level during "educational programs". Training strategy consists in creating integration processes among the "traditional" teaching activities and those, which could be defined as "borderline", that is to say experimental and beyond the borders of traditional pedagogy. The success of this new model lies in achieving the ability to perform many tasks well and being able to integrate them well. This goal is accomplished through a particular hybrid learning experience that spans the entirety of the possible educational programs inside and outside the university. The answer to a distinctive positioning strategy is therefore a veritable network of activities which requires, however, coherent protection of the core competences of university research and business units, and consequently of human resources. Based on these initial assumptions, the levers to pull to obtain a pedagogical system based on convergent variables, crucial to realizing students' project design practicums, are the Educational Research Units



#### (UdRD).

The theoretical and methodological knowledge, the abstract culture, still now of basic importance to skillfully maneuver in the complex world of project design, needs to be more and more strongly contaminated with behavioral abilities, technical and technological knowledge, which means with an operational culture tied to "knowing what" and to "knowing how" to do, aspects often acquired through practical experience completed directly in contact with the application contexts. "Skills" are now usually defined as "knowledge in action", they mediate between know-how acquired through theory and know-how acquired through practical application and direct comparison. Therefore, attention to learning processes in turn shifts to knowledge creation and transfer processes (*learning by doing, learning* by *using, learning* by *interacting...*). It is necessary to reconsider the distinction between theory and procedure, which is still influenced by the artificial distinction between science and technology and therefore, between designing and producing. These distinctions, however, besides being limited because they don't consider, for instance, the procedure of turning knowledge into a finished product, do not take into account that procedure is, by its own meaning, aimed at acquiring knowledge that can be re-elaborated from a theoretical point of view.

We should therefore free ourselves from the model stating that the relationship between theory and practice is mostly unambiguous. From this point of view, not only do the activities and location of an interdisciplinary experience suggested by a new project pedagogy constitute an important training moment, but also the whole world of production becomes a source of knowledge. This highlights the need for professionals on loan from industry to be part of the teaching staff. Actually, particularly in the present phase, besides the implicit knowledge typical of the project experience, industrial systems are becoming important containers of complex forms of design, innovation and technological knowledge. The firm therefore, becomes, for example, an important reference model in studying the methods used in presiding over cultures and capitalization processes and in replicating project design procedures, by constantly developing and bringing upto- date the know-how that converges in project elaboration. From an educational point of view, the management and re-elaboration of information derived from articulating a project, becomes a further training opportunity. For this reason, it is equally important for the student to learn to share results as well as the intermediate stages of any experience or research project. The student needs to learn to demonstrate his "knowing to be" on the appropriate occasions, that is, by actively taking part in conferences, seminars, fairs and other events: this experience involves a change in the student's own knowledge and skills to adjust them to the role he must interpret each time, according to the self training principle. The student will be guided to participate actively in his own training, without any obligation to predetermined plans or roles, "but learning to learn", through a path which will last his whole professional life: from institutional training aimed at preparing him for the job market to constant updating, through post-degree courses, learning new on-line research and study methods, and experience in a *collaborative* network (independently from the organizing structure). Legally recognized training courses will become progressively in-house and external workshops and short courses. Their value stands exclusively on the acquired competence and actual market recognition. In the same way, the professor will have to be able to manage relationships with the industrial world in the complexity of the whole production sequence, and in the relationship that might arise between production and the students' course of training and self training: to achieve this goal, the professor should acquire a set of methodologies, tools, software, locations and training opportunities, as well as be knowledgeable about the intangible values (trust/confidence, knowhow, experience) that are at the basis of the business culture and that need to be transferred to future designers already during the course of their university training. One of the pedagogical objectives I pursued all these years as far as project pedagogy is concerned, is the teaching of values, instruments and techniques, and project planning sequence of industrial products. Through parallel collaboration between the professional and university worlds, we duplicated in the classroom and in the firms (together with firms, professionals, tenure track and non tenure track professors and scholars) project development lines, which resulted in the realization of new products, innovation and technology transfer. Normally, two important stages are contemplated; the first is the participation of one or more industrial producers which interpret the market and the short term trends that affect the market in which they are active. The second stage contemplates the shared participation of professors who are specialized professionals in product development, supporting and introducing operational schemes on project design on different scales of actions.



#### CONCLUSIONS

The starting point is the real working method, presented in the form of *case studies*, which analyzes and compares the different approaches, values and advantages. The companies involved supply a series of market analyses and perspectives, identifying research subjects at different stages: definite projects, to be hypothetically transformed in future projects, projects more free from realization restrictions concerning products for the near future, perspectives of new evolutionary concepts to be interpreted as further future incentives. The final objective of this course is to develop innovative concepts of products, redesign existing objects and to develop new kinds of products, always keeping clearly in mind that the final idea of the industrial design laboratory is to finalize projects, so that they can be converted into prototypes along the whole course of training. The teaching methodology stands on the students' development of scenarios, concepts, draft renderings, preliminary models expressing ideas tobe developed in a second stage where its feasibility is analyzed, anticipating and hypothetically considering the different technologies to be adopted, on the basis of the project requirements and the needs of the company involved in the training program. This particular university experience tries to reproduce the project design experience typical of the industrial world and will train students to approach the customer's needs and to identify an accurate development path for the project, so that problems can either be anticipated or the student can actively take part in their solution.

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# Learning Difficulties in the Study of Structural Analysis in Tertiary Institutions

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In Education lies the bedrock of the future. Sustainability in education can be achieved through the transfer of knowledge and technology to the next generation and one of the vital ways of achieving this is through teaching in the classroom. Without proper dissemination of these knowledge and skills, there is a disconnection and the students are left without the proper foundation they should have in the first place. Several studies have shown that student experience difficulties in mathematical based courses. This study sought to identify the challenges students of structural analysis face and the factors responsible for these challenges. A survey of three institutions was carried out and data was obtained through the distribution of well-structured questionnaires to students that offered structural analysis from University of Lagos, Covenant University and Yaba College of Technology. Data obtained from this survey were analyzed using Statistical Package for the Social sciences. The results were presented in form of frequency tables using relative index importance index to get a clearer view of the most significant factors. Results from the factors affecting students learning difficulty of the course showed that, poor background (in physics & mathematics) from secondary school made the course difficult for them, their lecturers mode of delivery made the course uninteresting, and also the class sizes were also a problem. To curb this situation, it was recommended among other things, that lecturers should try as much as possible to deliver the course in creative ways that would entice the interest of the students. Secondary and primary school education should be improved, by investing in continuous workshops, seminars and training of teachers to improve their productivity, and lastly, public universities should admit the number of students they have enough resources to cater for, so as to reduce the class sizes. Education, mathematical based, learning difficulties.

# **INTRODUCTION**

There are several factors that have been identified as contributors to students learning difficulties in which includes, peer pressure, parental and home background, teacher's attributes, school environment and socio-economic status of the student (Riliwani, 2014).

However, it attention has been paid to the attributes of teachers as a critical factor influencing the academic performance of students. It is believed that the students success is hinged on the effectiveness and efficiency of the teachers (Sabitu and Nuradeen, 2010).



Therefore, how knowlegable a teacher is and how well the teacher is able to adopt the apt strategies will play a significant role in the teaching process (Zarei and Sharifabad, 2012).

Parental and home background is another significant factor, because according to a saying charity begins at home, so no matter how effective or ineffective a teacher might be, the background given to a child (student) would always serve as a pulling or pushing factor.

Furthermore, the school environment is also another critical factor affecting learning especially in the developing nations of the world, due to poor facilities and lack of appropriate teaching aids. for examples, there are some public schools in Nigeria that cannot afford enough chairs for their students, hence some of them have to stand for hours stretch receiving lectures, some institutions do not even have the right textbooks and resources to stimulate the interest of the student, also other environmental factors like improper ventilation, inadequate lightning and a host of them contributes to the difficulty in learning. This singular factor is what distinguishes the performance of students in Africa to other developed nations of the world (Riliwani, 2014)..

#### **RESEARCH PROBLEM**

Structural analysis being a combination of two core science subjects which are mathematics and physics have imposed a lot of difficulties on student (Johnson and May 2008), this proposition has been backed up by several researches like the engineering council of British (2000), which explains that Academics may encounter challenges of a weak foundation they may have had in mathematics and physics prior to their admission into a university. Johnson and May (2008) further expressed that one of the challenges encountered is the fact that an increasing number of students join a discipline without having an appropriate understanding of mathematics.

It has also been observed that architectural students have the highest number of failure in structural analysis. According to Herr (2013) the main challenge of structural education in architecture are the students trying to incorporate structural design into their applied design skills. This research sets out to empirically answer the bogging question of how students really respond to structural analysis and the difficulties encountered.

## SIGNIFICANCE OF THIS STUDY

Every sector in the world is experiencing tremendous changes, including the construction industry. Nowadays constructions which were previously deemed impossible are being made possible due to a better understanding of structural analysis and design. Since a good understanding of structural analysis is one of the brains, behind the great innovation in the construction industry, then it is important that students have a good knowledge of the course, so that they can become relevant in the construction industry, hereby having a successful career. This study would trigger this, by helping the student to identify what they feel about the course, the challenges encountered, and then appropriated solutions will be provided.

Furthermore, this study is of inestimable value to the respective institutions, as it will help them identify what student think about the course, the challenges the students are encountering, hereby creating a platform for them to know how to increase productivity hence improve the performances of the students at the same time.

Lastly, this research work will help the construction industry and society at large to boast of well-rounded graduates, who can withstand the ever-increasing changes taking place in the construction industry, through the adequate knowledge and application of structural analysis

#### **Research Questions**

- 1. What are the factors responsible for difficulties student face in learning structures and determine the severity ranking?
- 2. What are the agreement ranking of students' responses and factors?

#### **Research Objectives**

- 1. To identify the factors responsible for difficulties students, face in learning structures and determine the severity ranking.
- 2. To determine the agreement ranking of the learning difficulties students come across in the study of structural analysis, among Architecture, building, civil and quantity surveying programs.



#### LITERATURE REVIEW

Structural analysis is an ancient craft and has been known to humankind since the onset of civilization. The earliest structures have included the pyramids built by Egyptians around 2000 B.C, Parthenon at Athens (2500 years old), these structures have gradually progressed to the Taj Mahal (350 years old), and Eiffel tower (120 years old) thereby testifying to the skill and the advancement human achievement. That these monuments are still standing speak to the great accomplishment of the craftsmen in the construction of large structures which invariably involve analysis and design.

Amazingly, these monuments were constructed not only without any computation but also without any theoretical concepts as we know it today (Pedron, 2006), but these masters used the knowledge of rules of proportion developed through experience and practical training. These rules of proportion were what developed over the years to form the fundamentals of mathematics and physics, so to say that these great feats achieved by these outstanding craftsmen were a proper understanding of mathematics and physics would not be an understatement. Having identified evidences from researchers that a faulty foundation in mathematics and physics, amongst others are the problems facing students' structural analysis skill, then it is best to deduce the causative factors.

Learning is difficult to define and there is scarcely one universally acceptable definition that has been acknowledged by researchers, theorists and practitioners (Shuell, 1986). In the same manner, students also vary, and hence there are differences in the difficulties encountered by them. In a research conducted by Felder and Brent, (2005) they noted that different students can be motivated by different things and each student possesses a unique attitude towards learning. They further observed that no two students are exactly the same as they have different backgrounds and upbringing and characteristics that make their individual approaches to studying unique. The diversities of students' approach to learning and orientation to studying were examined by (Irfan and Shabana, 2012) they identified three approaches to learning, the surface approach, the deep approach and the strategic approach. Students who adopt a surface approach to learning usually dwell on facts but do not delve deep to understand reasons behind the facts such as origins and limitations. They are motivated to study solely to avoid failure thereby making their motivation extrinsic. The students who adopt a deep approach to learning go beyond memorizing the facts but rather dwell on understanding the intricacies of the material they are studying. Their desire to learn more is sparked by intellectual curiosity. This motivation is indeed intrinsic. The third group which consists of students that adopt the strategic approach to learning are a category that are efficient and well organized in their efforts, they know where they are in their studying and know the effort they need to put in to achieve the success they desire and attain their ambition.

Very obvious that if the difficulties encountered by students have different diversities, also parameters in judging the students' performances should also vary, the analyses of the students' performance would then help to get to the root of the difficulties student encountered.

Hansen, (2000) outlined two factors that affect students' academic performance. They are the internal factors which include class size, learning facilities, environment of the class, innate ability of the student, motivation, complexity of the course material, teachers' role in the classroom, technology used in the class and the exam system; and external factors, which constitute social economic factors, extracurricular activities, family problems. Further research conducted by Bangbade, (2004) shows that students performance may also depend on other factors such as gender and age differences.

School environment when analysed has a great role to play in difficulties students' encounter, the more conducive the environment, the lesser the difficulties students' encounter. Social environment could mean a conducive learning environment, availability of good teaching aids (computers, teachers, laboratories, libraries etc.) For example, temperatures above 80 degrees tend to produce harmful physiological effects that decrease work efficiency and output.

It was noted further, that poor ventilation interferes with students' ability to understand. Also decaying environmental conditions such as poor lighting, inadequate ventilation, inoperative heating and cooling systems etc. can affect the learning of students i.e. in any learning environment, comfort is vital to improving student's assimilation rates. Overcrowded institutions are a serious problem in many school systems. Crowded classroom conditions not only make it difficult for students to concentrate on their lessons, but inevitably limit the amount of time teachers can spend on innovative teaching methods.



In a study on class size, (Ronald et al, 2001) observed that changing how students learn can be achieved by simply changing class size because it is believed that class size is pivotal to achieving a good learning experience. While the class size is important, there are other factors on which learning is dependent. These factors include the background of the student and the influence of the broader community.

Interest in the job fuels passion for the job and a lack of interest in a job will lead to the inability to be good at it. There is a relationship that exist between a teacher's interest in the job, knowledge of the the subject, ability to communicate effectively and the overall academic performance of the student (Riliwani, 2014). A research by (Wenglinsky, 2000) on how a teacher's experience affects a student's ability to learn showed that a positive relationship exists between the teacher's years of experience and effectiveness. This implies that an inexperienced teacher is less effective in passing knowledge acoss to students. Other researchers (Starr, 2002), (Schacter and Thum, 2004), Rivkin, Hanushek, and Kain. 2000). Also studied the relationship between students' academic performance and the teachers' skills and attribute and it was discovered that there exist a strong relationship between the three variables.

According to a research by Umar *et al.*, (2010), it was explained that cults, which are associations with organized structures have a way of looking out for the interest of their members can influence and impact positively or negatively the performance of a student who is its member. These cults entice prospective members with the perceived benefits they offer such as protection, popularity and even sometimes assistance in school fees payment. The problem usually arises when the student member does not strike a balance between the demands of his studies and the demands of the cult association because most times the promised benefit never get to the student members.

It was argued that students make educational decisions by calculating their costs, anticipated benefits, probability of success, and the attractiveness of alternative options (Breen and Goldthorpe, I997). Because these aspects vary among socio economic status (SES) groups, the degree to which students of different socio-economic backgrounds view schooling as desirable varies as well, it was also maintained that student begin to understand at an early age about how the society is structured. They begin to become to be aware that the society rewards people or individuals of different SES differently, therefore these students of low SES families realize that they are likely to be exempted or excluded from desirable job and hence, they go through a process of disillusionment. As a result, these students expect a wide gap with age due to students' being less motivated and placing efforts into their academic activities.

# METHODOLOGY

#### Area of study

The study was conducted in Covenant University, Ota and two Lagos universities, the first one which is University of Lagos, Akoka and Yaba School of technology. The reason for choosing these other two institutions in Lagos state universities was because one represented a federal government institution while the other represented a state institution.

#### **Population of study**

The targeted population for this study were students in 100-500 level studying any construction related courses basically architecture, building technology, Civil Engineering and Quantity surveying in covenant university, university of Lagos, and Yaba College of technology.

#### **Data collection instrument**

Data used for this research were obtained from using multiple choice structure questionnaires to answer the question of student's response to calculation based courses. The questionnaire was adopted from a rigorous review of the literatures used. The questions were in a 5-point Likert format ranging from (SD= strongly Disagree, D=Disagree, U= Unsure, A=Agree, SA=Strongly Agree) which were used to measure the respondent response and factors affecting the learning of structural analysis as a case study. the questionnaire consists of two sections.

#### Sample size and administration of the research instrument

A sample consists of selected elements, subjects or observations from a given population. It is a finite part of statistical population of which properties are studied to gain information about the whole population. For the purpose of this research work, a survey was conducted and it was realized that all together in the three institutions there were more than a thousand students in the courses. Therefore, for this research work 195 questionnaires were distributed and 164 were retrieved which is 84.10%.



#### Research instrument for data analysis using Statistical package for social sciences (SPSS)

Statistical package for social science (SPSS) was used to process and analyse the information obtained from the questionnaire survey. Mean and agreement ranking were used to achieve objectives 2 and 3 as stated in chapter one by the use of SPSS. The result gotten would be made in a pictorial form for example pie chart and also frequency table for clarity of the analysis of the obtained data.

#### **Descriptive tools**

These are the tools used for describing the entire population or samples. This helps to show the relationships among the variables and other significant features. These tools are very useful in conveying quick impression of any clustering variations and possible trends in the value of variation. An example of such tools collected in the analysis of this data includes charts, frequency, percentages and measure of central tendency.

## ANALYSIS AND DISCUSSION OF RESULT

#### **Demographic distribution of respondents**

In the first section, the personal data of structural analysis students were acquired through the self-administered questionnaires. Information such as gender, institution, levels and departments were analysed. The following were discovered

Covenant University had 77 respondents; university of Lagos (UNILAG) had 47 respondents while Yaba School of technology had 40 respondents. The following data shows that Covenant University had the highest respondent for the study, owning to the fact that it was the researcher's institution.

In order to get accurate information, and views from different sides, the entire department offering structural analysis were included in the research work. From the figure above building technology had 36.27% of the respondents, followed by civil engineering with 33.33%, also Architecture had 25.49% and lastly quantity surveying with 4.90% of the total respondent. The department of building technology has the highest number of respondents for this research work.

It was also observed that 100 level respondents had the lowest percentage at 4.90%, followed by 200 level respondents with 7.84%, 300 level respondents with 17.65%, 400 level respondents at 24.51%, then 500 level respondents which carries the largest percentage at 45.10%.

The reason 500 level respondents had the largest percentage was because the researcher assumed that, the respondents had spent quite a considerable time doing structural analysis, therefore with their experience they could provide accurate information.

The gender distribution of the respondents was as follows; it indicated that the male gender has 65.69% while the females have 34.31%. From this distribution, the male gender had a greater population than the females, the reason for this is not far-fetched as the construction industry is male dominated.

# Factors responsible for learning difficulties amongst covenant university respondents, University of Lagos and Yaba College of Technology.

The factors were divided into positive and negative factors with the positive affecting their success and understanding of the course, structural analysis. The negative factors on the other hand related directly to the reasons for the difficulties experienced in the study of the course. The factors were ranked according to the responses obtained from each university. And the results are displayed in tables 1 and 2 below.



 Table 1 Negative factors causing learning difficulties amongst covenant university, University of Lagos and

 Yaba College of Technology respondents.

FACTORS	Covenant university	Rank	UNIVERSITY OF LAGOS	Rank	YABA COLLEGE OF TECHNOLOGY	Rank	Remark
The prior background I had makes it difficult for me to understand structural analysis	3.77	1 <sup>st</sup>	3.59	2 <sup>nd</sup>	2.33	7 <sup>th</sup>	Negative factor
The Lecturers' mode of delivery makes the course uninteresting	3.56	2 <sup>nd</sup>	3.38	3 <sup>rd</sup>	2.5	5 <sup>th</sup>	Negative factor
The class is too large and I am unable to follow	1.85	7 <sup>th</sup>	3.62	1 <sup>st</sup>	4.04	1 <sup>st</sup>	Negative factor
I have a solid mathematical background but struggle with the basics of structural analysis	3.4	4 <sup>th</sup>	3.28	4 <sup>th</sup>	3.58	3 <sup>rd</sup>	Negative factor
I have a poor mathematical background and it makes it difficult for me to understand the subject	3.25	6th	2.97	7 <sup>th</sup>	3.63	2 <sup>nd</sup>	Negative factor
My physics background from my secondary school education is poor and therefore an obstacle to understanding structural analysis	3.27	5 <sup>th</sup>	3.28	4 <sup>th</sup>	3.28	4 <sup>th</sup>	Negative factor
The lecturer is not able to communicate the subject area clearly and I find it difficult to keep up	3.5	3 <sup>rd</sup>	3.28	4 <sup>th</sup>	2.38	6 <sup>th</sup>	Negative factor

From the table 1, it can be observed that the major problem encountered by the public institution is the class size while for Covenant university that represents a private institution, the major problem is the prior background of the student as the class sizes are regulated. Closely related in agreement is the ability of the student to relate structural analysis with his/her basic knowledge of mathematics and physic. Despite the solid mathematical background, they still struggle with understanding basic structural analysis. This problem of not being able to understand the course could be closely tied to the mode of delivery by the lecturers and the inability of the lecturers to communicate the subject area. Poor mode of delivery will fail to spark interest of students and that will translate to their poor performance in the course.



 Table 2 Positive factors causing learning difficulties amongst covenant university, University of Lagos and Yaba College of Technology respondents.

FACTORS	Covenant university	Rank	UNIVERSITY OF LAGOS	Rank	YABA COLLEGE OF	Rank	Remark
I have no problem understanding the basic structural concepts	2	6 <sup>th</sup>	3.38	1 <sup>st</sup>	3.5	2 <sub>nd</sub>	Positive factor
The Lecturer has no problem communicating and expressing himself/herself	3.27	3 <sup>rd</sup>	3	2 <sup>nd</sup>	3.54	1 <sub>st</sub>	Positive factor
There are practical examples provided in class that makes it easy to understand the concepts and principles of structural analysis	3.29	2 <sup>nd</sup>	2.79	5 <sup>th</sup>	2.79	6 <sup>th</sup>	Positive factors
The lecturer takes time to solve examples in class to give us a better understanding of the subject area	3.6	1 <sup>st</sup>	3	2 <sub>nd</sub>	3	5 <sub>th</sub>	Positive factor
The tools for teaching structural analysis are available and we are exposed to them	3.19	4 <sup>th</sup>	2.69	6 <sup>th</sup>	3.08	4 <sub>th</sub>	Positive factor
We are exposed to the use of computer softwares to aid in structural analysis	2.24	5 <sup>th</sup>	3	2 <sub>nd</sub>	3.33	3 <sup>rd</sup>	Positive factor

The table 2 shows a summary of positive factors ranked amongst Covenant University, university of Lagos and Yaba School of technology. From the above table, it can be observed that the ability of the lecturer to communicate the subject area and expose the students to examples ranked highest among Covenant University responses. This will help with the students' performance in the course. In the public schools, their main concern is understanding the basics of the course but in the private school, their understanding was hinged on the lecturers taking time to explain and work some example in order to help with their comprehension.

#### CONCLUSIONS

1. The major problem most students are facing was as a result of faulty background, especially in the core science subjects (physics, mathematics, chemistry) which is a stumbling block to them understanding the course

2. Class sizes is a problem, especially to the public universities as most of them inferred that they are unable to follow up and concentrate when lectures are going on, due to the large crowd. This is in agreement with (Ronald et al, 2001; Westerlund, 2008; Bedard & Kuhn, 2008)

3. A teacher's ability to communicate the subject area and engage the class will help with the students understanding the course and preforming well in the course. This is in agreement with (Bangbade, 2004; Starr, 2002; Schacter and Thum, 2004; Rivkin, Hanushek, and Kain. 2000).



4. Exposure of students to computer aided software, that would help their understanding and appreciation of the course.

#### RECOMMENDATIONS

The following are recommended to minimize learning difficulties students encounter in construction measurement.

- 1. Secondary and primary school educations should be improved, by investing in continuous workshops, seminars and training of teachers to improve their productivity. Also there should be continuous monitoring and evaluations of teachers' performance, in order to ensure that students are well informed.
- 2. Public universities and higher institutions should restrict their admissions to the number of students they have enough resources to cater for, so as to reduce the class sizes. Should in case they want to admit quite a number of students they should ensure that they are divided into groups and given different lecture times.
- 3. Lecturers should try as much as possible to deliver the course in creative ways that would entice the interest of the students. This entails a balance between theory and practical, in which could be achieved by showing students life model of how some structural concept works. Also the classes should be interactive so as to reduce anxiety and fear.
- 4. Also, there should be provision for computer aided software, examples of which are. These computer soft wares simplify the work of the lecturer and hastens the understanding of the students, as it translates the whole structural concept from abstract to reality, boosts the creativity of the student, and lastly helps students to solve real life problems.

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# Learning Programs for Teachers Through the Development of Rescue Robots

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## ABSTRACT

In recent years, science and mathematics phobias in children have become a matter of serious concern. STEM (Science, Technology, Engineering and Mathematics) education is important for the future of children and the growth of the nation; therefore, it has been emphasized in many countries. However, STEM education requires good-quality teachers and teaching material. Therefore, this study focuses on improving the knowledge and teaching ability of STEM teachers. Herein, we developed rescue robots for developing teaching materials and learning programs for teachers via group learning and active learning. These learning programs can not only develop robot-building and programming skills but also improve problem-solving and communication skills

# INTRODUCTION

In Japan, there has been a reduction in the number of engineers because of declining birthrates and aging. In addition, science and mathematics have become a serious matter of concern in children. The lack of interest in STEM among Japanese youngsters has led to the relocation of technologies to overseas companies. It is therefore necessary to create interest in STEM studies among Japanese children.

The STEM field forms an important part of the social infrastructure. In the United States, STEM education is given its due importance, and this has brought about changes in income and occupation among the poor sections of society (Rodger, 2010, pp. 996).

In Japan, STEM education has increased in importance, and there has been substantial research in this area. In our previous studies, we have developed teaching materials to learn processing technology, control, and programing by making biped robots (Tsuyoshi & Fumitaro, 2015, pp.171–177). We also developed a robot that was able to learn the process of manufacturing from the design to the manufacturing stage using 3D printers (Tsuyoshi & Fumitaro, 2015, pp. 29–35). In STEM education, to increase the effect, new learning methods, such as active learning, need to be used.

Active learning has been investigated by various researchers for a long time. Charles and James found that active learning increased learning effects (Charles & James, 1991). Burr summarized the reference materials for active learning (Burr, 2010). In this study, active learning is developed using a 3d printer. Then, students examine their own functions and designs according to the conditions and objectives presented by the teacher.

Recently, in Japan, certain unpredictable disasters have occurred, such as the Fukushima accident, and the big earthquake (Kobe and Kumamato). To resolve these problems, it is required that is not only learn to a highly knowledge and technologies but also ability of its solved by myself. Therefore, the Ministry of Education, Culture, Sports, and Technology of the Japanese Government considers the positive adoption for active learning in the next curriculum guidance for defining the basic standard for education (Ministry of Education, Culture, Sports, Science and Technology-Japan, 2015).



Classes using active learning are required because they not only evaluate from the examination point of view but they also evaluate the process of thinking. However, it is very difficult to evaluate the process of thinking; therefore, various methods of evaluation have been studied (Scott et al., 2014).

STEM education and active learning is different from the traditional classroom teaching. In active learning, students learn while thinking through various tasks. For such classes, the teachers are required to have the necessary knowledge and technique. However, compared with the traditional learning methods, active learning increases the burden on teachers. Teachers need to carefully set their teaching goals, plans, and evaluations. In general, very few teachers have experimented with active learning. Therefore, we have developed learning programs that teach experientially about active learning methods by using a rescue robot, programing, and games. This program allows students to learn programming by making robots. When teachers attended these learning programs, they experienced active learning; consequently, the teachers could use the active learning methodology in their classes.

# **RESCUE ROBOT**

A rescue robot does not follow a fixed curriculum; the students select the modules according to their needs and combine them. Finally, the rescue robot made by student runs a course with obstacles.

# **RESCUE ROBOT (HARDWARE)**

The rescue robot hardware was prepared using a "Twin-motor gearbox (ITEM70097)" and a "Single gearbox 4-Speed (ITEM70167)" manufactured by "TAMIYA INC" as the power unit. For the drive system, we used a "Pin spike tire set (ITEM70194)," "Off-road tire set (ITEM70096)," "Slim tire set (ITEM70193)," "Slick tire set (ITEM70192)," "Truck tire (ITEM70101)," "Ball caster (ITEM70144)," and "Truck & Wheel set (ITEM70100)" manufactured by "TAMIYA INC." The system was prepared using a body plate and some parts were made using a 3D printer. Table 1 provides a list of the used parts. The robots made by combining these parts will run through a course with obstacles and compete for time on a group-by-group basis. These parts can be attached and detached easily with screws on the vehicle's body plate; each student can select necessary parts according to the purpose and can change the function.

## Table 1: List of parts

Shape	Part Name	Shape	Part Name
	Twin-motor gearbox (ITEM70097)		Single gearbox (4-Speed) (ITEM70167)
	Pin spike tire set (ITEM70194)		Off-road tire set (ITEM70096)
C	Slim tire set (Large) (ITEM70193)		Slim tire set (Small) (ITEM70193)



Ø	Slick tire set (ITEM70192)		Truck tire (ITEM70101)
	Ball caster (ITEM70144)	<b>6000</b>	Truck & Wheel set (ITEM70100)

## **RESCUE ROBOT (ELECTRIC CERCUIT)**

"Raspberry Pi Zero W" (hereinafter "Raspberry Pi") was used for the circuit board. Table 2 summarizes specifications of the Raspberry Pi.

The extension circuit board of the Raspberry Pi has dc motor drivers at 2ch, analog-digital converters at 4ch, servo motor drivers at 16ch, and some digital I/O ports. In this circuit, the program is visually easy to understand because some LEDs were connected to GPIO of Raspberry Pi.

#### Table 2: Specifications of the Raspberry Pi Zero W

CPU	BCM2835 Single-Core 1GHz	Memory	512MB
Graphic	Mini-HDMI	Other	40-pin Header
USB	USB-OTG + USB-Power		CSI Camera Connector
Function	Bluetooth/WLAN(only Zero W)		

Figure 1 shows a block diagram of the extension circuit. It has been made using the extension circuit board that is the same size as Raspberry Pi, and it is made of two pieces. The board is connected directly with a connector without using cables. Figure 2a shows extension circuit boards, and Figure 2b shows the board connected to Raspberry Pi. It is used to a USB mobile battery that is commercially available for power supply. Table 3 provides a list of sensors prepared as parts.



Figure 1: Block diagram of extension circuit





Figure 2a: Extension circuit boards



Figure 2b: Board connected to Raspberry Pi Zero W

Table 3: List of sensors	
Name	Detail
Touch sensor	It attaches the micro switch to the car body and makes the ON/OFF judgment for the switch using the GPIO
Reflective photo sensor	It detects infrared reflection and discriminates between black and white.
Distance sensor	It is measures the distance using the time that fires ultrasonic wave and returns.
Color sensor	It determines the color. This result shows a number of RGB.



3-Axis gyro sensor	It is a sensor that measures acceleration. It is able to detect the inclination.
Camera	It is connected to the camera connector on the circuit board, and it has an infrared (IR) mode and a visible mode. It is possible to shoot in dark places because the IR mode is able to shoot using IR.

# PROGRAMING (SOFTWARE)

We used Scratch2.0, which was extended to Raspberry Pi. Scratch2.0 is an open-source programing language.

Figure 3 shows the screenshot of Scratch2.0. It is developed using "Adobe AIR," and it can be operated in the same GUI environment without considering the differences in operating systems. **Figure 3**: Screenshot of Scratch2.0

Scratch uses a type of block. It is different from C language and Java language; there is no need to write the program syntactically. It can be programed easily and connected to instruction blocks. Even children who cannot operate the keyboard can handle it easily. Therefore, it takes less time to master the language operations. Numerous studies on Scratch have been conducted in education (Naoki et al., 2014, pp. 545–547; Satoru, 2013, pp. 21–26)

It runs Linux on Raspberry Pi, and a simple web server written using the Python language. In the Web server, a command is sent from a PC that performs programming through Web API, and a signal is sent to the motor driver via the port of Raspberry Pi.

Scratch incorporates the function of controlling the microcomputer as a standard, but the available microcomputers are limited to LEGO Wedo and Pico Board. Therefore, the HTTP extension of Scratch is used when you execute the program and an instruction is sent to Raspberry Pi via a wireless LAN. We were able to execute the HTTP extension of Scratch only on the localhost or github.com because of security concerns. It executes reverse proxy software on running Scratch, that is, it sends data to Raspberry Pi by using a wireless LAN. Scratch accesses the reverse proxy on the machine by HTTP. Tape is a software name for the reverse proxy. The reverse proxy sends data to Raspberry Pi, which is connected by a wireless LAN according to predetermined rules. Therefore, it is able to execute the program and operate robots without connecting serial and USB cables. Figure 4 provides an overview of the programing environments.



Figure 4: Overview of programing environments

# CURRICULUM

The purpose of this curriculum is as follows:

- 1. To learn the program structure and create it.
- 2. To learn logical thinking.
- 3. To find the assignment themselves and set their goals.
- 4. To clear the given conditions and solve the problem.
- 5. To experience active learning.

As a result, teachers will be able to make the learning process interesting for students.

The points to keep in mind when creating the assignment subjects are as follows:

- 1. They are able to teach the concept of programming and competition within a limited time.
- 2. They are not too difficult and are easy to understand.
- 3. They have restrictions, such as the number of parts that can be used to make the robots and the budget.
- 4. They will enable learning in groups.
- 5. They will progress like a game, and it will feel like going along the story in an RPG.

An example of an assignment subjects is "An engineer is at a space station. A robot that was exploring Mars broke down. Create a rescue robot within a limited timeframe and budget." This scenario is discussed in groups. Figure 5 shows an example of the competition course. In this course, there are obstacles and slopes. The black line is the trace that the robot passed.



## Figure 5: Example of the competition course.

It is the learning characteristic of various sensors. The student plays the role of an engineer and makes a robot, selects parts, and creates a program. Then, the time it takes to run from the start to the goal is measured.

Table 4 summarizes the timetable and contents of the study to be applied in the learning example. It explains how to proceed and provides the contents of the scenario. The learning contents are focused on the programing and control. This forms the introduction that will go on for over an hour. In this part, it explains the motor, the driving system, and the sensors. The driving system includes the tire and the caterpillars. It does not learn about the details of the electric circuits. The students design and make their robots in two hours. The function of programs and how to make a program are explained. The sensors and motors are connected to the microcomputer board, and it is moved by the program and by learning the basic knowledge of control. Programing languages are not learned, but logical thinking and the flow of the control of robots is learned. A program is made in two hours. The robot runs the course and makes adjustments within an hour. The robots run the course and compete for time. Finally, the features and hardships faced by groups when they made the robots are presented. It is possible to improve ingenuity and applicability through sharing. Such experiences also improve teaching skills and enable them to offer interactive classes for their students. Figure 6 provides a demonstration on how to make a robot.

Time	Contents	Detail
	Introduction	Explain the scenario.
	Introduction	How to proceed with learning.
1.0h		Explain the motor and drive system.
	Explanation of each part	The function of sensors.
		The type of sensors.
		Design in groups.
2.01	The Design	Make a robot according to the given purpose within a given
2.0h		budget.
	Make the robot	Prepare the necessary parts and assemble the robot.
2.0h Expl	Explanation of programing	The function of program.
		How to make a program. (How to use "Scratch".)
	Make a program using a robot	Make a program according to the purpose.
1.0h	Tuning	Drive the course and make adjustments.
1.0h	Competition	Competition.
1.0h	Presentation and review	Presentation of the features and hardships of the robot making.

Table 4: The timetable and contents of study to be applied in the learning example.





Figure 6: A demonstration on how to make a robot

### CONCLUSIONS

We proposed a learning program for teachers who teach programming using active learning. STEM education has gained in importance all over the world, and learning is made effective using active learning. However, to conduct active learning and STEM education, setting appropriate subjects and teaching skill is required. It is concluded that this learning program is able to teach programing experientially by using robots and active learning. Using programming helped us develop a learning program that incorporates active learning. Its contents helped students learn how to solve assigned tasks within a limited timeframe using limited resources. Such experiences also improve teaching skills and enable students to offer good, interactive classes for their students.

In this learning program, students evaluated the time they took off the course and whether they were able to clear the given conditions. The evaluation of active learning needs to be thoroughly studied to determine whether students are able to clear their tasks in this learning program. Therefore, this learning program will be evaluated using questionnaires, performance evaluation, and behavior analysis. It is necessary to study the evaluation method of active learning. We concluded that it is necessary to establish a method that can evaluate by designing quantitative evaluation criteria.

#### ACKNOWLEDGMENT

This work was supported by The Ministry of Education, Culture, Sports, Science and Technology(MEXT) Grants-in-Aid for Scientific Research (KAKENHI) Grant Number JP17H0202.

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# Learning to Connect Between Balance and Equivalence: Solving Linear Equations Using the Algebraic 'Balancing' Method

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#### ABSTRACT

This study implemented the use of balance method in solving linear equations to a total of 53 middle school students. Previous research indicated clear connection between the equal sign and the pivot of the balance, and also between the physical removal of object and subtraction. Furthermore, the students were able to 'see' the answers when presented with the problem of finding an unknown on a balance. From learning the balance method, the students were expected to achieve the main objective, which is learning to connect between balance and equivalence. Additionally, the students will be familiarized with the actual meaning of the term 'equal', thus leading to a better understanding of equivalence that may lead to improvement in students' achievements in solving algebraic equations. In this study, pre- and post-tests were administered with the intervention lessons conducted in between. Comparisons between the tests and analyses of the responses from the tests revealed that the students were mostly successful in solving linear equations with the application of the balance method. However, some students still made errors even when using the balance method.

Keywords: Balance Method, Algebra, Mathematics, Middle School

#### INTRODUCTION

One of the lesson objectives in Algebra requires students to learn to solve algebraic equations and more specifically linear equations. Algebra has a significant role in mathematics education and yet algebraic understanding has been lacking amongst the students. This problem has been associated with students' inability to grasp some fundamental concepts, particularly the concept of equality (Knuth et al., 2006). Accordingly, the students' performance on solving linear equations was found to be dependent on students' knowledge of equivalence. In solving linear equations, students were at first expected to find one unknown variable. There are different strategies for solving algebraic equations. Knuth and colleagues categorized the strategies into 'pre-algebraic' and 'algebraic'. The former consists of 'guess and test' and 'unwind'. In the unwind method, the equation is solved backward by inverting the mathematical operations starting with the constant value on one side of the equation (Nathan & Koedinger, 2000; Knuth et al., 2006). Evidently, the pre-algebraic strategy does not accentuate the balance in an equation. In contrast, solving equations using algebraic strategy emphasizes the symmetry of an equation by performing the same operation on both sides of the equation. Students can only execute this algebraic 'balancing' strategy once they are able to understand the idea of balancing.

Transformational aspects of algebra, however, cause students to approach solving equations by strictly using rules and procedures (Gavin & Sheffield, 2015). Gavin and Sheffield described this feature of algebra to mean grouping similar terms and applying inverse operations. This application of inverse operations corresponds to the unwind method. As a consequence, students tend to ignore the meaning of algebraic expression and ignore the concepts behind the generalization of the rules. Due to this reason, there is an apparent need in recognizing equivalence.



Generally, solving linear equations with one unknown variable is part of the curriculum for the 6<sup>th</sup> Grade students and again in Grades 7 and 8 (Vlassis, 2002; Knuth et al., 2006). Similarly, in Brunei Darussalam, the students are taught the basics of solving linear equations with one unknown from 6<sup>th</sup> Grade (Chua et al., 2016; Yunus et al., 2016). The topic is then repeated in the 7<sup>th</sup> Grade syllabus and continues on to the next level by increasing the number of unknowns, for example in the topic of simultaneous equations.

#### **REVIEW OF THE LITERATURE**

Most of the methods used for solving equations are well recognized and formally stated in most educational journals and articles. One of the widely accepted algebraic methods involves performing the same operation in on both sides of the equation (Vlassis, 2002). This concept can be achieved using the balance model. As stated by Suh and Moyer (2007), the students are first encouraged to use informal strategies to represent their relational thinking. Examples of these strategies are the seesaw concept and the balance scales (e.g. Mann, 2004; Vlassis, 2002; Gavin & Sheffield, 2015).

#### **Relational Thinking**

The rationale for the balancing method is based on students' lack of relational view on the equal sign. A relational thinking is seen as if students are able to work out the meaning of equal sign as 'the same as' (Knuth et al., 2006). Knuth et al. found that students who lack relational understanding of the equal sign were more likely to solve the linear equations incorrectly. This corresponds to a study by Borenson (2013), which found that it is essential for students to grasp the relational meaning of the equal sign for them to be successful in solving the algebraic part of mathematics.

Mann (2004) suggested that students be inculcated with the thought of relational meaning of the equal sign by initially teaching the the concept of balance. The main aim of her study was to transform students' view of the equal sign from 'the answer is' to 'is the same as.' A seesaw concept was used as an introduction to the balancing method. It begins with the students becoming a seesaw by putting their palms facing up at a shoulder level. Imaginary apples and oranges were then presented whereby the apples weighed less than the oranges. The students were able to master the seesaw concept by leaning further to either left or right when one side of the seesaw is heavier than the other. Also, they were capable of putting the seesaw into balance again. For instance, after having one orange on their left hand, the teacher questioned the effect on the seesaw once another orange is added onto their right hand. Afterwards, the students were requested to set up some rules for the seesaw. They managed to demonstrate their understanding of the balancing concept through the rules listed i.e. they successfully learned how to keep the seesaw balanced. For example, one of the rules involved taking away or adding the same weight to each side. Then, the students were requested to think about the link between the equal sign and the seesaw. One of the students answered that if two oranges are on each side of the seesaw then it is the same. This result indicated that the students recognised the equal sign as a representation of equivalence and balance. Hence, the knowledge of relational meaning of the equal sign was well absorbed by the students.

Despite not introducing an unknown variable yet, the balance model was an effective introduction for students to understand the relational meaning of the equal sign. Borenson (2013) suggested to start teaching the concept of equivalence non-symbolically followed by relating to the symbolic notation. In other words, by thinking of real life problems that relates to equivalence without introducing any algebraic notation as adopted by Mann (2004) with the seesaw concept.

### The Balance Model to Find the Unknown

The balance model can be applied to determine an unknown variable in an equation. The exploration of the concepts of equality and balance scales were also executed in a study by Gavin and Sheffield (2015), but with the introduction of an unknown weight on the balance scale. Again, the application of real life situation was demonstrated to the students. They were given a question involving fish on a balance scale and were asked to illustrate the weights of the fish by writing an equation before finding the unknown weight of the fish. The teacher guided them to use n to represent the unknown weight. The outcome of the study turned out to be positive, where the students were able to set up the equation by means of their understanding of the balanced fish on the balance scale. They also managed to figure out the solution through valid reasoning and justifying their methods.



The Previous study carried out by Vlassis (2002) also involved calculating the unknown value,  $\mathbf{x}$  using a balance scale. At the same time, the suitability of the balance model was investigated. Vlassis used two different shapes to represent variable  $\mathbf{x}$  and the numbers; square and circle respectively on a balance scale. Instead of just having the unknown on one side of the balance scale, the author set the unknown on both side of the scale. Some students succeeded in using the correct method to find the value of  $\mathbf{x}$  just by observing the scales. For instance, the same amount for  $\mathbf{x}$  was crossed out from each side of the scales and also same for the numbers. It was clear that they were performing subtraction and hence understood the concept of balance scales. Consequently, the students managed to grasp the idea demonstrated by the scales i.e. performing the same operation on both sides.

The objective of learning the balance method is to recognize that the same operations were performed on both sides to solve any equation. The result from the study by Vlassis (2002) showed that all the students demonstrated the application of the balance concept and were able to solve the equations with less difficulty.

# **Balance Model as a Visual Representation**

Apart from influencing students' perception on equivalence, the balance model made use of representation tool to guide students to understand mathematical concepts. According to the Lesh's representation model (as cited in Suh & Moyer, 2007), if a student could make sense of the mathematical ideas then one should be able to translate that idea into a pictorial representation, where the students decided to solve the equation given by drawing a balance scale model in their study.

A disadvantage found in using the balance method is the generalization of the method itself (Vlassis, 2002). An actual balance scale was initially used to introduce the balance method and the procedure always involved removing or crossing out certain weights from each side of the scale. In other words, the only arithmetical operation perform is subtraction. Therefore, when applying to solve the equation, students have the tendency to relate the procedure of the balance method by subtracting expressions to cancel them out even if the coefficient of the expression is a negative. This corresponds to the second problem for balance method, which is the introduction of negative numbers (Vlassis, 2002; Warren & Cooper, 2005).

During the introduction of the balance method using balance scales, none of the weight of the blocks represents negative numbers. The model is also not capable of representing negative quantities as the value of the unknowns (Aczel, 1998; Warren & Cooper, 2005). As a result, when solving linear equations, students develop some errors due to the presence of the negative integers. Therefore, when using the balance scale to represent equations, it is only applicable to show positive coefficient of variable and positive numbers. However, balance scales is a balance model to demonstrate the algebraic method, and once the students grasp the idea of balancing, they will be able to see the concept of performing the same operations on both sides of equations. Hence, this can be applied when solving equations. To avoid any mistakes, these problems should be addressed to the students right after the introductory lesson to the balance method. Examples on how to solve linear equations using the balance method should be demonstrated to the students. Alternatively, as mentioned by Goh et al. (2017) for the use of manipulative in learning addition and subtraction of both positive and negative integers, 'Balloon and Weights' were applied to represent negative and positive integers respectively, may it be in the form of computer software (Lamb & Thanheiser, 2006) or paper and pencil version (Janvier, 1983). Here, we can use similar concept of 'Balloon and Weights' as part of a more advance adaptation of balance method.

#### THE STUDY

The purpose of this study is to introduce a new learning tool for the students to broaden their knowledge of mathematical algebra and facilitate solving linear equation. From learning the balance method, the students are expected to connect between balance and equivalence, familiarizing with the actual meaning of the term 'equal'. Thus, better understanding of equivalence will be achieved and will lead to improvement in students' achievement in solving algebraic equations.

This method has the potential to visibly show the students the 'behind the scene' activity of solving equations. According to Pirie and Martin (1997), there is a clear connection between the equal sign and the pivot of the balance and also between the physical removal of object and subtraction. They further concluded that the students were able to 'see' the answers when presented with the problem of finding an unknown on a balance. The research questions in this study are, "How significant is the difference in student's performance before and after the intervention lessons? (RQ1)" and "How can the balancing activity help students to solve linear equation with one unknown variable? (RQ2)"



#### METHODOLOGY

#### **Participants**

The participants for this study were convenient sampling of 53 7<sup>th</sup> Grade students from two classes in one of the middle schools in Brunei Darussalam. The school was a government all-boys school located in one of the districts in Brunei. Both classes were treated using similar instruments for the collected data. The 7<sup>th</sup> Grade students chosen for this study have completed solving algebraic equations syllabus, including the linear equations, in their 6<sup>th</sup> Grade. Hence, the 7<sup>th</sup> graders were expected to comprehend the idea behind solving linear equations without any complications.

#### **Data Collection**

# Pre- and post-tests

The pre- and post-tests were designed to address the first research question (RQ1), and consisted of ten questions on solving linear equations with one unknown variable. The two types of linear equations included equations with the unknown on one side and, equations with the unknown on both sides of equations. The aim in administering the pre- and post-tests was to observe any improvements on the students' performance in solving equations after the intervention lesson. Most of the questions from the pre-test were from the work of Linsell (2009) in investigating the strategies of students for solving linear equations. Some questions were also adapted from the past examination papers. The post-test questions followed the same format as the pre-test but using different numerical values. Face validity of the test was checked by the two teachers, both with more than seven years of teaching experience, of the selected classes, to ensure that test items were relevant for the 7<sup>th</sup> Grade students and made to measure the students' ability in solving linear equations

## Students' responses in the pre- and post-tests

The students' responses and strategies in both the pre- and post-tests were studied to answer the second research question (RQ2). This was done after all the students' tests had been assessed. The students' responses were analyzed thoroughly with the purpose of further investigating if the improvement in students' achievement after the intervention lesson was due to the application of the balance method.

#### Procedures

The first step before conducting the research was sending permission letters to the principal and the head of department of mathematics of the school. The outline of the study was then discussed with the head of department and the teachers of the selected classes. The number of participants and the available timetable for managing the selected class were also discussed. Parental consent forms were given to each student and also the participant consent form to confirm the students' voluntary participation in the study.

The study was conducted over a period of two weeks for each class. The two classes were named Class A and Class B. During the first week, the pre-test was given to the students. The lessons on the balancing method were carried out in two sessions (four periods with 30 minutes per period). The post-test was administered shortly after the intervention lesson.

#### **Intervention Lessons**

There were two sessions in the intervention lessons. The first session was on the introduction of the balance method and solving linear equations with unknown variable on one side of the equation, and the second session on solving linear equations with unknown variables on both sides of the equation. The duration between the two sessions for each class was 3 to 4 days. The gap between the two sessions was due to the class timetable and this also gave the opportunity to examine whether the students have learned and understood the introduction of the concept and not just committing it to memory.

During the first session, the students were posed with a simple question "Have you heard of or seen a balance scale before?" The picture of a balance scale was then shown to the students. The session proceeded in teaching the students the concept of balance scales by asking a volunteer to portray as an 'empty balanced' scales and the students were requested to think what would happen to the balance scale i.e. the student's long-stretched arm when an object is placed on one side of the scale (adapted from the work of Mann, 2004). This was to generate the idea of 'equivalence' into the students' mind and hence promoting that balance and equal means the same. To verify whether the students understood the general idea of a balance scale, real objects were used and in this case, the objects were small plastic boxes. The activity before was repeated except students could now refer to the objects and physically move them to or from either side of the balance scale.

The lesson continued with the introduction of an unknown weight on the balance scale (using the student's arms as balance scale). There were five boxes in total: four boxes with each labeling a weight of 100 grams and a box

with an unknown weight. The boxes were arranged with three boxes weighing 300 grams altogether on one side of the balance scale and on the other side, one box weighing 100 grams and one box with the unknown weight. This scenario was presented to the students for them to guess the value of the unknown weight using their earlier understanding of the concept of balance e.g. removing boxes from each side of the balance scale. This also aimed to relate calculating the unknown weight of a certain object on one side of the scales to finding the value of unknown variable in an algebraic linear equation that was done right after in the same session.

The students then referred to the board where a balance scale was drawn. Cutouts were used to represent numbers and unknown variable, x, on the balance scale e.g. a square cutout to represent x and a circle cutout to represent the value 1. Firstly, two circles were placed on the board on the left side of the balance scale and also a square. Then, another five circles were put on the right side of the balance scale. The display of this presentation can be seen in Figure 1. Again, without an algebraic equation, the students were asked to find the value of x using the idea of balancing. After working out the value of x, a subject on algebraic expression and hence algebraic equation were brought upon. For example, the students were urged to determine the algebraic expression of the left side of the balance scale, which was x + 2. Then, the students were made to think of the meaning of balance once more. This in turn gave the algebraic equation x + 2 = 5, which corresponded to the diagram drawn on the board (Figure 1). The equation was then used to link by removing two circles from the balance scale with the mathematical operation subtraction i.e. subtracting two from each side of the equation.



Figure 1: Diagram of a balance scale as drawn on the board with cutouts placed on it

A handout that contained one page of examples and another page of questions for classwork was given to each student. The lesson resumed by going through the first two examples using a balance scale drawn on the board and the cutouts. The two examples were: x + 3 = 7 and 2x + 2 = 8. An illustration of the second example can be seen in Figure 2b. Again, the balancing concept using the balance scale was applied first. The students were asked about the number of circles that should be removed and to connect this with one of the four basic mathematical operations. This was the first example by which there existed a coefficient of the unknown variable *x*. Once the equation was simplified to 2x = 6 (Figure 2b), the fact that 2x means 2 times *x* was obtained from the students upon questioning. A subsequent question asked was "How do we get *x* on its own or by itself?" and the students were expected to respond correctly e.g. divided by 2. Therefore, by using the balance method, the solution was obtained once the right side of the equation was divided by the same constant where both sides of the equation was divided by the same constant of 2.



Figure 2: Second example given during the lesson

In the same session, 'removing' negative number was also taught and acknowledged by the students. For instance, the fourth and fifth examples on the handout, which were: y - 5 = 11 and 3y - 8 = 19. The drawing of a balance scale was no longer used at this point as there were no representation of a negative number on a balance scale i.e. no cutouts to represent negative quantities (similar to the study by Warren and Cooper, 2005). But this did not prevent the application of the balance method on an equation involving negative quantities whether as a coefficient of the unknown variable or as a constant. Hence, the fourth example began by recalling the previous examples to the students on how the positive constant was removed i.e. by subtracting. Accordingly, the same question was presented regarding the negative number. Explanations were conveyed and the students were reminded on the outcome when performing addition to a negative number. When necessary, a number line was drawn on the board. For the fourth example (in Figure 3), the negative constant -5 was removed by adding a positive constant 5 to it and the same was done on the other side of the equation to get the solution.


Figure 3: Fourth example given during the lesson

Continuing the lesson, the students were shown how to use the balance method for an equation involving algebraic fraction. Similar to the previous example, a balance scale could not be illustrated for this type of equation. However, the students were expected to already grasp the idea of balancing method that is performing the same operations on both sides by the final example. The algebraic equation for the last example was  $\frac{n}{2} = 6$ . A familiar question was again proposed: "How do we get the *n* on its own or by itself?" The students were guided by rephrasing the question to "What should we do to make the algebraic fraction,  $\frac{n}{2}$  becomes n?" To help the students further, the term 'reciprocal' was indicated. Regardless, the method was demonstrated to the students (as shown in Figure 4). The algebraic fraction was multiplied by its reciprocal, which was 2, and thus, the other side of the equation also multiplied by 2. Subsequently, the students were given classwork to be handed in by the end of the lesson. The classwork consisted of equations of a similar form as the given examples.

$$\frac{n}{2} = 6$$
$$\frac{n}{2} \times 2 = 6 \times 2$$
$$n = 12$$

Figure 4: The method demonstrated to the students

The second session was carried out a few days after the first session. The lesson involved unknown variables on both sides of scales (adapted from the work of Vlassis, 2002). Again, cutout squares and circles were used to represent unknown variable x and numbers respectively. The lesson started with the recall of the previous session and doing an example related to it without using a diagram of a balance scale. For that reason, the relationship between balance and equal was focused on once more. In the second session, the handout was given immediately to the students. Using the cutouts and the drawn balance scale on the board, the first two examples: 2x + 4 = x + 7 and 2x + 6 = 4 + 4x were solved (as shown in Figure 5). Since the unknown variables were on both sides of the equation, the students were told to focus on the constant first to avoid confusion.



Figure 5: Examples using the cutouts and the drawn balance scale on the board

A third example involving no constant on one side of the equation was shown. This type of equation was included to demonstrate how the balance method could be applied to solve it. The equation mentioned was 5m + 15 = 2m. If the image of balance scale was in the students' mind, taking 15 from one side of the scale without having another 15 to remove from the other side of the scale did not seem to be logical. Therefore, it was required to show how it was possible to use the balance method to solve the equation (shown in Figure 6).

$$5m + 15 = 2m$$

$$-15 - 15$$

$$5m = 2m - 15$$

$$-2m - 2m$$

$$3m = -15$$

$$+ 3 + 3$$

$$m = -3$$



#### Figure 6: The solution for the third example given to the students

As in the previous session, 'removing' negative numbers were also included in the second session. The only additional part was explaining to the students how to remove the unknown variable with negative coefficient by subtracting. The fifth example in the handout is shown in Figure 7.

$$3n - 5 = 9 - 4n$$
  
+5 +5  
$$3n = 14 - 4n$$
  
+4n +4n  
$$7n = 14$$
  
+7 +7  
$$n = 2$$

Figure 7: The solution for the fifth example given to the students

The final example in this session also covered solving equation involving algebraic fraction. Before the end of the lesson, the students were given classwork. In the second cycle, explanations were conducted to inform the students that the balance method was related to their previously learned method, which was the unwind method or the 'moving to the other side' method for most of the students. The balance method was described as the 'behind-the-scene' to the method that the students were used to.

#### **Data Analysis**

All of the students' results were collected and entered into the SPSS software package. The pre-test items had a Cronbach's Alpha of 0.734, which showed that the pre-test was reliable. The reliability test was also carried out on the post-test items and the Cronbach's Alpha was found to be 0.653. Since Cronbach's Alpha was used to test for internal consistency of the items in the tests, the results showed that both test items was internally consistent and the tests were reliable for the study (Drost, 2011). The independent t-test was then used to examine whether there was a significant difference between the mean score from Class A and Class B since each class belonged to a different cycle in the action research (Pallant, 2001). The two variables needed for this test were the independent variables (Class A and Class B), and the continuous dependent variable (pre- and post-test scores). Subsequently, any significant differences in the students' performance were compared and determined prior to using the balance model and after learning the balancing method, in other words, the students' scores in the pre-and post-tests. For the paired data, there were few tests in SPSS to analyze the significant differences. In the case where the data may not be normally distributed, a non-parametric test (Wilcoxon Signed-Rank Test) had to be carried out.

In order to determine whether balancing method was helping the students in solving linear equations, the students' answers and strategies were analyzed in two ways. Firstly, the number of correct attempts in the post-test was studied to see how many of these correct attempts were caused by students using the balance method. Secondly, the students' workings were carefully observed to compare their strategies in the pre-test with their method in the post-test. This was to identify whether the students made any improvement when applying the balance method in the post-test.

# FINDINGS AND DISCUSSIONS

## **Students' Test Performances**

The differences between the scores from the pre- and post-tests were observed to determine if the differences are significant. However, before that, an independent t-test had to be carried out to examine if the two different group of students: Class A and Class B have any significant differences. This was done because the two classes did not belong to the same cycle. The result of the test is presented in Table 1. For both the pre- and post-tests, it shows that both group of students were not significantly different as the *p*-value for both were more than 0.05 (p > 0.05). Hence, both classes can be treated as one large sample without comparing between the different cycles.

Table 1: Independent t-test for the pre- and post-tests between Class A and Class B

	Pre-test	Post-test
Sig (2-tailed)	0.754	0.392

For the validity of the independent t-test, the scores in each group must be normally distributed (Pallant, 2001). In other words, the pre-test scores for both Class A and Class B should be normally distributed and the same is expected from the post-test scores. The outcome of the normality test is shown in Table 2. The Shapiro-Wilk Test shows that the significant value for both pre- and post-test scores for Class A are more than 0.05. Likewise, for Class B, the significant value is more than 0.05. Hence, the independent t-test is valid.

	Pre-test	Post-test
Class A	0.155	0.116
Class B	0.142	0.057

The mean scores of the pre- and post-tests were first determined to see any improvement in students' scores after going through the intervention lesson. The results show that there is an increase between the mean scores from pre-test (12.68) and post-test (13.87). A summary of the results is shown in Table 3. However, further testing is needed to check if the differences between scores are significant.

Table 3: Mean scores of the pre- and	post-tests and	the minimum and maximum	scores
	Pre-test	Post-test	

	Pre-test	Post-test
Mean Scores	12.68	13.87
Minimum Score	6.00	10.00
Maximum Score	17.00	19.00

The calculation of the differences between the pre- and post-test scores was then performed. A normality test was carried out on the differences and the Shapiro-Wilk test shows that its significant value is less than 0.05 (p = 0.00). The distribution of the differences between the scores is not normal and therefore the data is set for a non-parametric testing. In this case, Wilcoxon Signed-Rank test was used. The result of the test is presented in Table 4. The Wilcoxon Signed-Rank test indicated that the post-test scores are significantly higher than the pre-test scores (Z = -2.544, p = 0.011). Therefore, the result shows that there is a statistically significant improvement in students' performance before and after the intervention lessons. Consequently, responding to RQ1 whereby the differences in students' performance before and after the intervention lessons are significant.

Table 4: Outcome of the Wilcoxon Signed-Rank Test on the difference between pre- and post-test scores

	Post-test – Pre-test
Z	-2.544
Asymp. Sig. (2-tailed)	0.011

## **Balance Method and Correct Attempts**

The students' results were examined to determine the amount of correct attempts that were the consequence of students applying the balance method. In other words, whether the balance method contributed to most of the students' correct attempts. The results are shown in Table 5. It was observed that for each question (except for Question 7), more than half of the correct attempts included students using the balance method. This corresponds to the second research question (RQ2) whereby the application of balance method does help students in solving equations correctly.

Table 5: The number of correct attempts by the students using the balance met	hod in the post-test
---	----------------------

	1 2	6	
Question No.	Number of Participants	Number of correct attempts	Total number of
Question No.	using the Balance Method	using the Balance Method	correct attempts
Q1	37	34	48
Q2	28	21	38
Q3	13	6	18
Q4	41	30	39
Q5	38	26	34
Q6	22	7	13
Q7	31	0	0
Q8	43	11	12
Q9	42	7	7
Q10	21	7	8

#### **Applying the Balance Method**

To answer the RQ2 further, the use of balance method by the students in the post-test was examined. The main focus was to understand the students' abilities in attempting the question correctly in the post-test because of the application of the balance method prior to incorrect attempts to the question in the pre-test. The students'

technique in using the balance method was also observed including any errors made while applying the balance method.

## Analysis of the students' work

Question 1 – This equation only requires one step to solve it. In the pre-test, the students mostly chose the 'moving to the other side' method to solve the equation. However, some students attempted it incorrectly by confusing the signs when moving it to the other side. For instance, in Figure 8a, the student knew the method but did not apply it correctly. The same student then used the balance method in the post-test, which is shown in Figure 8b. Here, the example shows that balancing activity can help the student solve the equation accurately.



Figure 8: Student's attempts to Question 1

Question 2 – Similarly, for this equation, the students only needed one step to solve it. Most of the students used the 'guess-and-test' method to solve the equation in the pre-test. After the intervention lesson, the students mostly used the balance method correctly as shown in Figure 9.

(a)			(b)	2.	24 = 4x
	2.	24 = 4x = 4 G = x			4x = 24 $-4$ $x = 6$

Figure 9: Students' correct attempts to Question 2

However, some students noticeably applied the balance method incorrectly. These students mistakenly subtracted 4 from both sides of equation instead of dividing 4. Examples of the students' answers can be seen in Figure 10 below. Note that these students were not from the same class.

2. $24 = 4x$	2.	24 = 4x	2.	24 = 4x
24 + 4×		-X4-th		- 4 - 4
- 4 - 4		- az x - 4		10 = X
20 = >		20=1		x = 70

Figure 10: Students' incorrect attempts to Question 2

Question 3 – This equation too can be solved by only performing one step. Yet almost half of the participants failed to answer this question correctly. Due to the introduction of algebraic fraction, confusion was apparent amongst these participants. Their pre-test showed most of them performing division between 5 and 4 and some was observed involving subtraction between 5 and 4. For example, student S5's response shown in Figure 11a and student S25's answer in Figure 11c. Following the balancing activity lesson, these two students attempted the equation correctly in the post-test as shown in Figures 11b and 11d.







Figure 11: Students' (S5 & S25) attempts to Question 3

Despite having learned the balance method, only a few students chose to apply it in this question. Those who used the balance method made one common mistake whereby instead of multiplying both sides by 3, these students divided both sides of the equation by 3, as shown in Figure 12. The other common mistake made was when the students subtracted 3 from both sides of the equation.



Figure 12: Students' incorrect attempts to Question 3

Question 4 – Solving the equation in this question would require the students to complete it in two steps. In the pre-test, it was observed that students experienced complication with the introduction of coefficient in front of the variable. For instance, some students took the first step to divide the constant 17 on the right side of the equation by 5, which is the coefficient of n (shown in Figure 13a). This was clearly based on their concept of 'moving to the other side' but instead of moving the constant -8 first, they looked at the coefficient of n. Other students attempted the 'guess-and-test' method successfully for this equation, but some failed to get the correct answer. After going through the intervention lesson, the same student from Figure 13a used the balance method in the post-test and got to solve the equation correctly.



Figure 13: Student's attempts to Question 4

Due to the negative constant 7, some of the students made the same mistake when balancing e.g. removing -7 by subtracting from it instead of adding to it. For example, the answers written by two students in their post-test, student S28 from Class A and student S41 from Class B are shown in Figure 14a and Figure 14b respectively.

(a)	4	3n-7=14	(b)	4.	3n - 7 = 14
		-f -f			5n=7 - 3n -3n
		3n=7			(1-)

Figure 14: Students' (S28 & S41) incorrect attempts to Question 4

Question 5 – This equation also requires two steps to solve. It was found that most students struggled in solving this type of equation in the pre-test because the unknown variable was on the right hand side of the equation. Despite that, almost half of the students attempted the question correctly using their preferred method. From Figure 15, it shows that both students applied the balance method correctly in the post-test despite not able to get the correct solution in their pre-test.

(a)	5. $32 = 22 + 5n$ -224 - 22 (0 - 5 n -55 - 55	(b)	5. $32 = 22 + 5n$ -32 - 232 -22 - 232 10 = 5/1 -5 = 15 2 = 10
	220		n = 2

Figure 15: Students' correct attempts to Question 5



Question 6 – Question 6 is almost similar to Question 3 since both questions involved algebraic fractions. The only difference was that a constant was added to the fraction for Question 6. This equation would require the students to solve it in two steps. Most of the students were able to do the first step in the pre-test, which was subtracting 12 from 17. But once the equation became  $\frac{n}{4} = 5$ , these students made the same mistake as in Question 3. Meanwhile, in the post-test, only a few students successfully completed the two steps using the balance method. This can be seen in Figure 16. The other students applying the balance method were only doing the subtraction of 12 from both sides, and when they ended up with again a similar form of equation  $(\frac{n}{4} = 5)$  as before, they were not able to solve it correctly even after learning the balance method. In other words, they kept making the same mistake when given an equation involving algebraic fraction.



Figure 16: Student's correct attempt to Question 6

Furthermore, there were other mistakes made by few students when applying the balance method. Figure 17 shows that both students tried multiplying the algebraic fraction first. Because of this, one student (Figure 17a) also multiplied the right hand side of the equation by 4 that resulted in an incorrect answer. The other student (Figure 17b) however misunderstood the idea of balancing method by trying to focus on removing the denominator of the algebraic fraction. Although the student did not perform multiplication on the other side of the equation, both two misunderstandings were similar and were due to their perceptions on balancing method when involving algebraic fraction where they needed to always operate on the algebraic fraction first.

(a) 6. 
$$\frac{n}{4} + 12 = 17$$
 (b) 6.  $152 \frac{n}{4} + 12 = 17$   
 $\frac{n}{4} \times n = 17 \times 11$   
 $n + 12 = 17$   
 $n + 12 = 17$   
 $-12 - 12$   
 $n = 5$ 

Figure 17: Students' incorrect attempts to Question 6

Question 7 – Question 7 onwards involved the equations with unknown variables on both sides of the equation. Although for this question, it also included not having a constant on one side of the equation. Evidently from the pre-test results, none of the students attempted this question 3x + 6 = x correctly. Different types of working were displayed and almost all indicated having error in attempts. For instance, a few students tried 'moving to the other side' method and obtained 4x + 6 from adding x to 3x and got 10 or 10x (from adding 4x and 6) as the solution.

During the intervention lesson, an example of a similar type of equation was presented to the students in the second session. Nevertheless, all of the students were not able to successfully solve the equation even with the use of the balance method. From Figure 18, when balancing, the three students did the first step correctly. But then, it shows that the students were not aware of x - x = 0 i.e. subtracting x from x would give them zero. And they did not end up with the simplified equation of 2x + 8 = 0. In fact, none of the students had the said equation. Apart from the three students (shown in Figure 18), most of the other students also obtained either 2x = 8 or 2x + 8 without an equal sign.

7. $3x + 8 = x$ $\sim -\infty -\infty$	7. $3x + 8 = x$ $-\chi$	7. $3x + 8 = x$
= 2x = 8 = 2 = 2	2×+8	2x+8
x=4	$\chi = 4$	X=6

Figure 18: Students' incorrect attempts to Question 7

There were a few students who almost achieved the correct solution. From Figure 19a, it is clear that student S53 incorrectly did the second step by subtracting 1 from both sides of the equations instead of x. However, he understood the method, simplified the equation to 2x = 8 and forgot about the negative sign. Student S48's

working in Figure 19b shows that he correctly obtained the equation 2x = -8 but then did not include the negative sign in his solution after dividing both sides of the equation by 2.

(a)	7.	3x + 8 = x -9 - 8 3x = x - 8	(b)	7.	3x + 8 = x	
		212 = 8 2			$\frac{-1}{2} = \frac{-1}{2}$	
		x = 4			x=4	

Figure 19: Students' (S53 & S48) incorrect attempts to Question 7

Question 8 – In the pre-test, most of the students showed incomprehensible workings as they made many algebraic misconceptions. The few students who attempted this question correctly were applying the 'guess-and-test' method and one did the 'moving to the other side' method. It was also observed that many students were using the 'guess-and-test' method incorrectly to solve this equation in the pre-test. For instance, one student's working can be seen in Figure 20a. It shows that the student tried m = 5 on the left side of the equation and m = 3 on the right side, which revealed that the student did not know the unknown variable 'm' should have the same value. There were a few other students who also made this similar mistake. In the post-test, the same student from Figure 20a managed to apply the balance method correctly to solve the equation as shown in Figure 20b.

(a) Pre-test	(b) Post-test
8. $5m-2 = 3m+6$	8. $5m - 2 = 3m + 10$ + 2 + 2
= 25 - 2 = 9 + 6	5m=3m+12
= 23-15	-3n - 3n 2 m = 12
=08	+ 2 + 2 m=6

Figure 20: Student's attempts to Question 8

Question 9 – In this question, both a negative constant and a negative coefficient were included in the equation. There were many incorrect approaches made by students in solving the equation in the pre-test. Most students tried the 'moving to the other side' method, but then the sign got mixed up. For example, the equation was 2p - 5 = 9 - 5p and it became 9 - 5 = 5p - 2p and also 2p - 5p = 5 - 9 after the students incorrectly applied 'moving to the other side' method. After the intervention lesson, only few students were able to attempt the question correctly using the balance method. Some examples of the students' work can be seen in Figure 21.

(a)	9.	3p - 3 = 11 - 4p + 3 + 3	(b)	9.	3p - 3 = 11 - 4p + 3 + 3
		3P= 14-4P +4P			$\begin{array}{c} 3p = 14 - 4p \\ + 4p & + 4p \end{array}$
		79=14			7p=10
		P=2			p = 2

Figure 21: Students' correct attempts to Question 9

When applying the balance method in the post-test, the students mistakenly removed 3p instead of -4p (refer to Figure 22). This led to more algebraic misconceptions in the next step of simplifying the equations.

(a)	9. $3p - 3 = 11 - 4p$	(b)	9. $3p - 3 = 11 - 4p$
	- 3P - 3P		-3p -3p
	-3 = 11 - P		-3=11-0
	1R 13		+3 +3
	5 DI 5		- 4-0
	= 14p		0=14
	-3 = 11 - 9 + B + 3 = 14p		-5p $-3p-3=11-0+3+3=14-00=14$

Figure 22: Students' incorrect attempts to Question 9

Question 10 – This equation had a more complicated algebraic fraction and solving it required three steps. Most of the students found this question difficult and only three students attempted this question correctly. Also, most students skipped this question in comparison to all the other nine questions in the pre-test. Those who attempted this question used the 'guess-and-test' approach (refer to Figure 23).

(a)	10. $2n = \frac{2n+16}{5}$	(b)	10. $2n = \frac{2n+16}{5}$
	= २×ि-म		$\frac{4}{27} \cdot \frac{\frac{x^2}{27+16}}{5} = 20$
	= 16+4		= 4
	= 20		
	= 20=5		2n = 4
	= 4		A=utio
	=		1= 2

Figure 23: Students' incorrect attempts to Question 10

There are some students who used the 'guess-and-test' method incorrectly in the pre-test and then managed to attempt the question correctly in the post-test using the balance method. The examples can be seen in Figure 24.

(a) Pre-test	(b) Post-test
10. $2n = \frac{2n + 16}{5}$	5n×2=2n+16×2
$= \frac{4n+16}{5}$	10n = 2n + 16 - 2n - 2n
= 20	$g_n = \frac{16}{4g}$
= 4	200

**Figure 24:** Student's attempts in using the balance method for Question 10

However, applying the balance method again could cause some misunderstanding amongst the students. In Figure 25a below, the student did the first step correctly but then when trying to remove 2n the student divided both sides of the equation by 2.

(a) 10. 
$$5n = \frac{2n+16}{2}$$
 (b) 10.  $5n = \frac{2n+16}{2}$   
 $2 \times 5n = \frac{2n+16}{2}$  (b) 10.  $5n = \frac{2n+16}{2}$   
 $10n = 2n+16$   
 $5n = \frac{2n+16}{2}$   
 $5n = \frac{2n+16}{2}$ 

Figure 25: Students' incorrect attempts in using the balance method for Question 10

Even though the application of the balance method in the post-test contributed to the correct attempts in the posttest, there were some unavoidable errors made by the students. Those who attempted the question correctly in the pre-test ended up getting the incorrect solution in the post-test after using the balance method. The evidences from the findings here have shown that the application of balance method did help the students in solving the linear equation correctly.

# CONCLUSION

This present study focused on the effects of students' achievements after learning the balance method to solve linear equation. Even though there were improvements after the intervention lessons, errors were still unavoidable when applying the balance method. During the intervention lesson, examples of equations that involved removing negative constants and also negative coefficient of variables through balancing activity were also included. Nevertheless, after examining the students' responses in the post-test, some students demonstrated their lack of understanding in the removal of a negative number, which supports the findings by Vlassis (2002). Consequently, several students adhered to the generalization of the balance method. With the introduction of the balance method, the students found solving equations with unknowns on both sides rather challenging. Although the balance method assisted in solving the two-step equations, it was evident from the results that the students were struggling in solving them. Concurring with the findings by Linsell (2009), the students in this study also found the equations involving algebraic equations difficult to solve in comparison to the other equations.

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# Literary Education: A Desired Challenge

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## ABSTRACT

In many different environments, including educational institutions, literature is often an overlooked subject. Observation shows that it is one of the school subjects with the most outdated teaching strategies and most certainly the most distant from new technologies, which prevents teachers from rethinking their methods. Analyzing the context of literature classes, having secondary education as our specific scope, the aim is to find out what are the best ways of proposing positive changes and what are our obstacles for doing so. In that process, it is possible to identify some of the most relevant mistaken beliefs among students and teachers. Addressing them directly, one might be able to renew the teaching approaches in literature classes, with good results being perceived in both short- and long-term cases.

Keywords: Teaching-learning strategies; Literature; Secondary education.

#### **INTRODUCTION**

Literature is often an overlooked subject. Amidst contemporary artistic expressions and different *mediums* we have nowadays, literature has come to be considered an outdated form of art. Therefore, regarding institutionalized education, the literary field has been considered a relatively outdated subject to be prioritized in schools. There is no notion, in secondary education, of literature as a priority or, at least, one of the priorities, even in schools where the Humanities are generally valued. While students often hear common statements such as "print is dead", "libraries will not exist anymore soon", and "we forget to counterbalance those (questionable) presumptions.

It is important to remember and underline the obvious: social life in general and the school environment are always interconnected. Those not two separate dimensions: the school environment reflects many wider social dynamics. If literature, as a school subject, is often seen as an unimportant field, this vision reinforces similar general perspectives in society as a whole, and vice-versa. As educators, not only we can, but also should look for ways of presenting the subject of literary works with all its richness. The direct access to the literary text is a rare approach in a classroom full of students – as if we simply forget that this means a classroom full of *readers*. The result is that we risk (or end up) losing most of those potential readers, whereas our job is to aim for the exact opposite.

Making an effort to understand the difficulties that appear to be inevitable when teaching literature, some questions are thus raised. First of all, comes the question of the origin of the situation. Why is literature teaching so stagnant, as well as so distant from those who justify its very existence (the readers, that is)? Does literature deserve its reputation of being another superannuated field? To what extent literature teachers should even preocupy themselves with this alleged reputation? Does it actually affect the students' relations to literature as a school subject? What about their relation with literary texts outside the school environment?

Other questions might arise, bringing some more detailed issues regarding literature in the current educational system. For instance, what is the part played by the drowsy weight of tradition and how do we identify the difficulties for innovation? There is more than one answer to each of those questions, because the contexts are more complex than we can perceive. It takes more than just catching a glimpse of the secondary education. It is always relevant to understand the social and economical context in order to take into consideration the specificities of each school. Different regions, cities, and countries might have extremely different needs, and the students might have considerably different brackgrounds. All of those details might affect the learning experience, as well as the teaching techniques, mutually and simultaneously. It is an amalgam of various aspects that we cannot always grasp.



Even though we know there are many different aspects to be taken into consideration, there are some general remarks to be made about literature as a field and as a school subject. They will not be true to every context, and it is extremely important to keep in mind that different social, cultural and economical contexts affect the educational processess in many ways. With no intention to reduce or oversimplify those aspects, it is useful to comprehend some aspects shared by many different teaching environments. This is the foundation of the present study, that seeks to underline some issues concerning literature as a school subject, specially in the secondary level. The intent is to understand some recurrencies and propose more interesting ways of seeing literature and prolific paths to educators of the field. It is undeniable that each educational context has negative and positive characteristics of its own ; the present study seeks, however, to propose solutions to some of the most common contemporary problems.

#### Death of literature classes

Seeking the major reasons for this decrease in prestige over the last decades, we might be able to clarify why literature has become seemingly less relevant. Firstly, as a field, literature is not always developing new technologies. It is not changing in an obvious way all the time, nor shifting paradigms every day. It is possible to argue that this would be a reason for such increasing lack of interest. Literature is presented in schools as something set in stone. Secondly, literature is often seen as a starting point for discussions only deepened in other fields. Literary texts frequently are source of information for investigations in history, sociology, psychology etc. Seeing literature as a source for those kinds of investigations is definitely an interesting interdisciplinary approach. We should not forget, however, that literature has intrinsic value as well. When we call a class a *literature class*, this implies thinking about literature itself as an important subject to be studied, not just as a history or a sociology class - specially if the nomenclature is not put into question. The specific value of a literary text is not to be forgotten; regarding the importance of literature, there is much to be considered in terms of ethical discussions, opening the possibility of questioning and comprehending deeply rooted cultural values (a function usually reduced to a so called "humanizing" effect inherent to literature). About this major potency of literature, able to bring virtue and moral values to the teaching environment, David Carr states: (...) there is clearly much for children and young people to learn — precisely to come to know and understand — about the value and implications of justice, honesty, courage, self-control, integrity, and other qualities of moral character for a flourishing human life. Moreover, as philosophers from Aristotle to Alasdair Macintyre have clearly shown (...) this is an enterprise that may be greatly assisted by the (judicious) teaching of good literature. To be sure, this should not be seen as the only educational purpose of literature, and there may be dangers-against which some latter-day aesthetic formal- ists have warned—of using such literature only as a vehicle for the teaching of other things. (Carr, p. 15)

With the purpose of understanding literary education, it can be useful to analyze the usual methodology to quantify and interpret results, in order to grade the students. The current measure to assess a student's learning process is universally test-based. Well, how would we be able to assess a student's knowledge about literature if we do not transform it into facts that can be demanded in a test? If there are many students, reading complex written assignments or exams can be practically impossible. This becomes a big issue when the model defines every aspect of class planning: classes in general do not open subjects to discussion, since the rule is to turn every subject into an unchangeable amount of fixed facts. The whole purpose is to be able to formulate questions about those facts and ask them in the form of a test, which is, of course, the exact same test for every student. We do that so we can find out to how many questions the students know the answers. That is the basic assessment dynamic in formal education.

There are many problems with that current assessment system; for the purpose of this paper, however, I will focus on the particular case of the lack of interest in literature classes, and the correlated fact that the prestige of the literary field seems to be decreasing in formal education, including the secondary education context. Regarding literature teaching, the major issue with the common system of assessment is that the objective questions-and-answers system does not always work well for art, or, more specifically, for literature. The reason is that, usually, this system simply does not permit taking into account the amplitude in interpretation of works of art, their openness and their complexity. Discussing works of art takes time, and the school curriculum is already full of contents to be covered. There are various ways in which works of art are not properly appreciated in formal education, but we can summarize this issue by saying that literature is not supposed to be about answering questions with definite facts that are either right or wrong.

Even if there are teachers who agree with that statement, the system does not change, and that discrepancy called our attention. At the same time, this dynamic of test-based quantifiable results is not a recent context, thus we have new generations of teachers who were taught that way since they were young, during all their basic education, and therefore do not question those methods. They often think that "being good at" literature (as a subject) is about knowing dates, names, and brief explanations for literary texts using general, superficial topics. Of course there are many exceptions to all we are indicating here, with many teachers who are able to teach literature in a much less autoimmune way, and we really could not say it is always possible to get rid of the test-based assessment. Unfortunately, changing the dynamic in a few classrooms does not change how things are done in general in most schools. That situation both impacts and is impacted by our beliefs about those fields of knowledge and the respective co-related professions; this includes prejudice, concepts of progress and intelligence and so on, culminating in society expressing opinions about prestige in professional choices and

Observing literature classes in secondary schools in Brasilia, Brazil, and asking simple questions to students and literature teachers, much can be analyzed, and this is something to be continually done. Some interesting findings can be shared in this paper, with results still to be deepened. The question I asked the teachers was as simples as: "How much would you say the students are interested in literature, specially in comparison with other school subjects?". This question was formulated with the intention of receiving a generalizing answer, in order to consider a broad vision rather than taking into consideration subjective aspects, personal preferences and other individual traits of their students. At the same time, the questions the secondary students were asked were also simple and straightforward: "Do you find literature classes interesting? Why/why not?".

about choosing careers for the status they provide. All of that is part of the aftermath of how we approach a

## RESULTS

subject in schools.

**\*** 500

Considering the totality of interviewees, all of them responded very differently to the first question ("Do you find literature classes interesting?"), demonstrating different levels of interest, although always pointing out that the classes were *not* very stimulating, even if they liked their teachers. Interestingly, they all answered very similarly to the second part – the question of "why/why not?" –, even considering the variations in answers for the first question. This demonstrates that the problems seen by the students (which correspond here to the alleged reasons for their lack of interest in literature classes) are generally the same, even when the levels of lack of interest vary. This also shows how the second part of the question ("why/why not?"), which is the most objective one, generated similar answers, whereas the first one generated a variety of answers. Accordingly, as expected, the first question lead to more personal and individualized perspectives, such as "I have always liked reading", or "no one in my family really reads, so I never had many books at home". It is possible, therefore, to focus on the second part as a good sample of answers for a more generalized investigation, knowing that they represent the views of people with diverse preferences and backgrounds, as well as different opinions.

It is thus possible to visualize some patterns, both from the general conversations with literature teachers and with secondary students, starting but not being limited to the specific aforementioned questions. For instance, when asked why they use so many texts with explanations for literary works instead of trying to make the students read those works and then discuss those explanations (or not), the literature teachers gave basically the same pattern of answers. First of all comes the question of the potential complexity of the subject, and literature's intricate form. It is commonly said to be "too difficult" to approach a literary text. Students are never old enough, never mature enough, it is considered that they never know enough to be able to read it and reach their own conclusions. It does not matter if they are twelve or twenty years old, it is still widely believed that they should learn conclusions from some literature textbook and/or from the teacher beforehand. What happens all the time is that they prioritize reading *about* literary styles and movements instead of actually being motivated about reading the literary works themselves - or, when they do, it is with no critical vision of it, since they already know they will find out what is it *about* from the teacher or the textbook. The experience of reading is thus not important, and that makes literature classes very pragmatic – and, ultimately, not at all pleasant. When students like the books they read, it is usually a book they have chosen themselves, and school simply ignores those readings. Instead, it would be interesting to consider bringing that pleasure of entertaining books closer to the traditional mandatory lists of readings. Following the logic of those books being "merely entertainment", teachers often lose an opportunity of bringing together the pleasure of reading and the potentiality for deeper discussions of more complex readings.

TCHET

What occupies all the space in literature classes is often history of literature, not literature. Partially because of the pressures of the institutions on completing the curriculum, literature teachers are used to summarizing those that are considered to be the most relevant characteristics of an author or of a literary movement and its canonical works. Reducing classes to that kind of schema, literature itself is, unfortunately, simply left aside, as if it would be "too complicated" to deal with it directly. This implies that it would actually be too complicated to see students reading (!) – and thinking – for themselves. The fact that the context of secondary education is usually defined by the fierce competition for university admissions is another variable in the equation. It makes it even harder to realize the importance of literature having a wider role in education, since the whole path is seemed as a straight path that leads to one sole goal: a diploma.

It is important to consider that the goal of getting a diploma and then being able to pursue goals in higher education is not a problem in itself; it is not a matter of completely changing this common goal, but of changing the midway. In fact, it is important to understand the importance of school subjects as part of this path. In the case of secondary education as a previous stage in the educational path of a student, we can also take into consideration how it prepares the students for the next level. That perspective can help visualize what is important in secondary education – considering, for instance, that, in higher education, students should "be empowered to consider their own values and future contribution to the world", and "also engage with international perspectives, developing their awareness of knowledge traditions from cultures that differ from their own" (Fung, p. 69). Those are goals that should also be taken into consideration in secondary education (within its limits and possibilities).

Additionally, the second reason for literature being left aside is that **in the end, it is not a priority to teach our students to think** – the main goal of schools, specially secondary education, is to assess students' knowledge focusing on getting them to higher education. All study aims at passing one final test in order to go to university, as opposed to a continuous process of developing different skills and sense of citizenship, general knowledge and the ability to observe the world critically. These abilities that might develop from reading literature are not so important to pass those tests in the Brazilian educational system, which is ultimately the only goal in formal education. Unfortunately, it is not a priority to make them read and think critically about any other subject if they are concentrated on reaching the sole goal of getting that degree. Students often do not enjoy being at school and experiencing the learning process; they often want to be done with school. Literature is not one of the most loved subjects by the students, it is viewed as boring and they know they have to know how to calculate or laws of physics or chemistry in order to pass the tests and later be accepted in college; they rarely know how to answer why waste time reading literature.

This also happens with foreign language learning. It is a significantly common mistake to believe that literature texts should not be used in the classroom until the student has an advanced level of proficiency, otherwise they would be too confused and the activity would therefore be inefficient. Practice, however, points in a different direction, showing that it can make a huge difference for students of foreign languages, including not only those keen to read literature for some reason, but potentially any student whatsoever.

When a student reads literature, she learns much more than the basic communication in that language. It is a broader knowledge in every way. The idea is that would be a waste of time since we should focus on everyday communication, but reading literature is also developing linguistic skills that we use all the time. It is a completely different use of language, but it is obviously enriching to know it, as opposed to mere "waste of time".

It is then easy to notice how many problems come up when dealing with artistic expressions as school subjects. There are several erroneous preconceptions that, in the end, underestimate student's abilities and consequently *under develops* their reading skills. Our intention is to disclose perspectives to be considered when teaching literature, rather than attempting to propose a perfect model of teaching (which does not exist). Literature is now marginalized as useless while it should be viewed as it is: a foundation, a subject that includes all other subjects in the sense it contains so much knowledge in the radically different uses of language. Reading literature is learning a whole new language. If we give up on everything that literature brings within itself, we are essentially giving up on the quality of education.



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# "Lived-In": Embedding Teacher Education in Middle & Secondary Classrooms

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# ABSTRACT

An overview of an award winning clinically intensive "lived-in" model to teacher education will be provided. For sixteen weeks, teacher candidates mentor, tutor, and teach middle and high school students, all identified as the school's most academically vulnerable. Under the supervision of their methods professor and a cooperating teacher, methods students plan and implement rigorous and individualized instructional units in schools. Teacher candidates are at the school Monday through Friday, and work in small groups to plan and implement instruction, grade student work, draw conclusions based upon analyzing student data, and implement enrichment and remedial interventions. Instruction by faculty takes place at the school, and they are consistently present, visible, and available on-site. This session describes how we have partnered with area schools and teachers to embed teacher preparation in schools, which allows us to deliver individualized and high quality instruction to some of our area's most vulnerable urban youth. Outside of proving a general overview of the course, materials and resources will be provide that outline course expectations and requirements by faculty.

## INTRODUCTION

It was Sir William Osler (1901) that noted, "He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all." This lack of commitment to teaching as a profession of practice fosters a gap between how teachers are trained and what schools actually need (NCATE, 2010). In order to grow as an educator, pre-service teachers well before student teaching, their culminating clinical experience, must be provided with sustained and supportive opportunities in schools that allow for meaningful interactions with Pk-12 students, teachers, administrators, and even university faculty. We believe university-based teacher preparation programs can engage in mutually beneficial partnership that both advance Pk-12 student learning while preparing the next wave of skilled and competent teachers that our society needs. Knowing that a transformation away from ineffective isolated field placements and towards university-school partnerships was needed, we set out to design and study a" lived-in" model to teacher preparation.

The leading national accreditor of teacher education programs, the Council for the Accreditation of Educator Preparation (CAEP), notes that "...to prepare for the unprecedented responsibilities educators are required to take on, the U.S. must dramatically transform teacher preparation" (NCATE, 2010). This transformation must entail teacher preparation programs and their faculty prioritizing and investing in initiatives that allow teacher candidates the opportunity to learn and train alongside university faculty in schools. This call for "learning about practice in practice" (Ball & Cohen, 1999) and for closer collaboration between Pk-12 schools and university teacher preparation program is not new and reaches back to the early 20<sup>th</sup> Century with calls by the National Association of Directors of Supervised Student Teaching, (which is) now the Association of Teacher Educators (Patterson, McGoech, & Olson, 1990). In fact, it was John Dewey (1904/1965) that noted the promise of grounding teacher education in practice and the lives of learners.



Several decades of research make it clear that critical elements of professional teacher practice can only be learned in real classrooms under guidance from faculty mentors (Zeichner & Bier, 2015; Ball & Cohen, 1999). Emphasizing educational philosophies and understanding education research becomes highly theoretical and undervalued without pre-service teachers having actual, concrete experiences with Pk-12 students to draw from in their teacher preparation experience.

Evolving out of the notion that subject-specific methods courses and their adjoining field placements, which usually come before student teaching, could do more to get students in supportive, sustained, and mutually beneficial field placements, we worked to locate models of teacher preparation that promoted strong collaboration and partnerships between schools and university teacher preparation programs. In addition, these placements would provide a rigorous, relevant, and differentiated curriculum to Pk-12 students (Kenyon, 2013; Passe 1994). It was essential for this model to allow university methods professors to deliver semester long on-site instruction and coaching to methods students, and to facilitate clear communication and interaction with cooperating teachers. This model also needed to embed teacher education in actual classrooms whereby university methods candidates plan, instruct, assess, and reflect with their methods professor for a sustained period of time in a real classroom with real students. Finally, it was essential that this model advanced and put at its center, the success of academically vulnerable Pk-12 students.

## IN PRACTICE: A LIVED-IN MODEL TO TEACHER PREPARATION

It is essential for pre-service candidates enrolled in methods courses to engage in supportive, relevant, authentic, and rewarding field experience in real classrooms (Kenyon, 2013; Adler, 2008; Henning & Yendol-Hoppey, 2004; Toll, Nierstheimer, Lenski, & Kolloff, 2004; Passe, 1994). Subject specific field experiences attached to and/or embedded in methods courses can play a significant role in laying an important foundation of pedagogical content knowledge before students move into full-time student teaching (Doppen, 2007). Research indicates that when methods professors place students in random classrooms candidates often experience instructional approaches and beliefs that run contrary to what they learned in methods courses (Toll, et al., 2004). As a result, university method teachings are "washed clean" or discredited by pre-service teachers as they advanced in their program. In order to avoid this washout and to better connect theory and best-practice, it was essential the methods professor spend significant time on-site delivering instruction, have a direct, supportive, and trusting relationship with the cooperating teacher, and that methods students and faculty be embedded for sustained periods of time in the Pk-12 classroom (Zeichner & Bier, 2015; Kenyon, 2013; Passe, 1994). For all of these reasons, a lived-in model for teacher preparation was implemented in the spring of 2012 in Author 1's social studies methods courses, and Author 2 soon followed with his implementation in the fall of 2016 in his special education methods course.

The authors learned about this cost-free model to teacher preparation and its ability to reach those most vulnerable students through Foster & Nosol's (2008) *America's Unseen Kids/Teaching English/Language Arts in Today's Forgotten High Schools: Teaching English/Language Arts in Today's Forgotten High Schools: Teaching English/Language Arts in Today's Forgotten High Schools.* Foster & Nosol discuss a lived-in model to teacher preparation that was highly successful in advancing a rigorous and differentiated English Language Arts secondary curriculum to some of this nation's most vulnerable high school students in Akron, Ohio. In this model, the authors identify the benefits of moving teacher preparation programs and methods courses into Pk-12 schools in order to leverage necessary resources to help our nation's most vulnerable ("invisible") students and to support the extra-ordinary efforts of teachers working in our most disadvantaged schools. Foster & Nosol assert this model not only benefits Pk-12 students, teachers, and administrators but provides an authentic and meaningful laboratory in which university faculty can work alongside teacher candidates in their teacher preparation courses.

Foster and Nosol (2008) identify the primary goals and principals of the lived-in model as the following:

1. Focusing on developing "strong" Pk-12 students (i.e. providing an advanced and meaningful curriculum, motivating and supporting academically vulnerable students, etc.)



- 2. Engaging in long-term, sustained relationships with Pk-12 students over the course of the semester. This included methods students building strong rapport with youth, individualizing and differentiating instruction, helping them feel welcomed and more visible in the classroom, and in building and maintaining a professional and powerful preservice teacher to Pk-12 student relationship.
- 3. Consistently reflecting on the quality of instruction, with their peers, cooperating teacher, and university methods professor, provided to Pk-12 students and adjusting their instruction and interactions where/when necessary to meet the needs of learners.

This lived-in model also provided a framework to meet the requirements under the Council for the Accreditation of Educator Preparation (CAEP) standards. CAEP requires university teacher preparation providers ensure that effective partnerships and high-quality clinical practices are central to preparation so that candidates develop the knowledge, skills, and professional dispositions necessary to demonstrate a positive impact on all P-12 students' learning and development (CAEP, Standard 2: Clinical Partnership and Practice). The authors attempted to align the components of the lived-in model with CAEP Standard 2 and its indicators for professional preparation. See table one for a detailed alignment of indicators and components.

Table 1: Alignment of Urban High School lived-in model to teacher preparation CAEP	standards	2:
Clinical partnerships and practice		

CAEP Standard	Indicators	Lived-in Alignment Components	
2.1 Partnerships for Clinical Preparation	Partners co-construct mutually beneficial P-12 school and community arrangements	Project leadership meetings once a month Project leadership listserv	
	Partners share the responsibility for continuous improvement of teacher candidates	Cooperating teachers and University professors collaborate on candidate performance evaluation (i.e. units, lesson plans, dispositions, professionalism, etc.)	
	Partners establish mutually agreeable expectations for candidate	Entry: prior coursework has been completed, minimum GPA in content area	
	entry, preparation, and exit	Preparation: All materials reviewed in advance and posted to calendar, timely grades and feedback given to Pk-12 students, collaborate well with all stake-holders when planning, implementing, and reflecting on unit Exit: Minimum of 100 hours in the field, C or better in course, participates in end of the year celebration with mentees at university.	
	Partners collaboration to connect theory and practice	Integrating research-based practices into lesson planning and units On-going program evaluation research Professor provided professional development to middle/high school teachers	
	Ensure coherence across clinical and academic preparation	Requires candidates to apply previously learned understandings in a supportive, school environment Feeder into student teaching	



	Share accountability for candidate outcomes	Priority employment opportunities and student teaching opportunities made available to successful university students
2.2 Clinical Educators	Partners co-select, prepare, evaluate, support, and retain high quality clinical educators (both provider and school-based) that positively impact candidates development and P-12 learning	Program faculty are on-site teaching methods courses Urban High School teachers' feedback help with continuous improvement of faculty and programs
	Collaborating with partners, providers to refine criteria for selection and performance evaluation of clinical educators	Project leadership meetings once a month Survey at end of the experience for cooperating teachers and faculty used for program
2.3 Clinical Experiences	Partners collaborate to design mutually beneficial experiences to ensure candidates positively impact Pk-12 learning Experiences are structured to	Project leadership meetings once a month Project leadership listserv Grant writing and research Performance based assessments enacted in
	provide candidates with structures performance-based assessment opportunities at key points in their program	middle/secondary classrooms Opportunities to use assessment data in decision making

# LIVED-IN TEACHER PREPARATION

Secondary Social Studies Methods

Drawing from numerous discussions with Hal Foster, as he is a colleague of both Author 1 and Author 2 at a midsized Midwestern university, and using his book as a resource, Author 1 decided to embed his social studies methods courses at a local urban high school. In this semester long course, twenty-three secondary social studies majors (gr. 7-12) were divided, based upon a matching inventory and placed into two different classrooms within this urban high school. These two classrooms, at the request of the instructor, served a high percentage of students identified as academically vulnerable. These courses were:

- A 10<sup>th</sup> Grade U.S. History Classroom with Cooperating Teacher 1
- 12<sup>th</sup> Grade Economics Classroom with Cooperating Teacher 2

Under this model, all teacher candidates enrolled in social studies methods (3 credit hours) and its co-requisite field experience (3 credit hours) were required to be on-site in their assigned classroom Monday through Friday from 12:50 p.m. until 3:00 p.m. This requirement was similar to the requirement Hal Foster had for his Secondary Language Arts methods students. Since Hal Foster's lived-in model was highly valued by administrators at one local large urban high school, Author 1 was invited by the Principal of this same school to meet with two social studies teachers in order to pitch the idea of expanding the lived-in model into social studies. Both social studies teachers agreed to work with Author 1 and his students. Our university course schedule was based upon the teachers' and school's block bell schedule. This schedule was:

- 6<sup>th</sup> block for both U.S. History and Economics met on Mondays and Wednesdays between 12:50-2:30 p.m. and on Fridays between 12:50-1:37 p.m.
- 7<sup>th</sup> block for both U.S. History and Economics met on Tuesdays and Thursdays between 12:50-2:30 p.m. and from 1:40-2:30 p.m. on Fridays



This timeframe worked well as it provided the methods students and Author 1 the opportunity to debrief on their teaching with the cooperating teachers at the end of the day, between 2:30-3:00 p.m. Monday through Friday. For an overview of how the class is delivered see table two below.

Scheduled time	Pre-service teacher activity
Email Sent Out 24 hrs. Before	Methods students' final briefing of the class on the next day's lesson.
2:50-1:40 p.m.	10 <sup>th</sup> Grade U.S. History class or 12 <sup>th</sup> grade Economics class
1:40-1:45 p.m.	While 10 <sup>th</sup> graders on a 5 minute break, university students debrief and discuss what to expect 2 <sup>nd</sup> half of class
1:45-2:30 p.m.	10 <sup>th</sup> Grade U.S. History class or Economics class
2:30-3:00 p.m.	University classroom (debriefing on the lesson with the entire university class- inclusive of U.S. History and Economics- with teachers, and overview of what to expect next class)

**Table 2:** Overview of delivery of program

Cooperating teachers, under this lived-in model, work alongside university methods professors on-site to promote strong collaboration and communication. On-site methods students researched and planned units of instruction for implementation in two periods (6<sup>th</sup> Block and 7<sup>th</sup> Block) in their teacher's classroom. In the first three weeks, methods students became acclimated to the school, built a strong rapport with their high school students, were issued copies of the curriculum (i.e. exams, content standards, texts, etc.) and began the process of planning rigorous and relevant units which were vetted by their methods professor and cooperating teachers. In weeks four through sixteen, pre-service teachers took over all instructional responsibilities for both blocks to implement their approved units. All units were required to prioritize an advanced curriculum focused on individualized instruction, small well supervised group activities, and project-based learning. For more information on how this new lived-in model, compared to the previously implemented traditional model at this university, see table three below.

**Table 3:** Traditional model compared to lived-in model

Traditional Model for Methods Courses (Before lived- in model implemented)		Lived-in Model to Methods Courses	
Lecture (on campus)	Monday & Wednesdays 1:00-3:00 p.m.	Lecture & Field Experience at High School	Monday through Friday 12:50-3:00 p.m.
50 Required Additional Field Hours	To be completed based upon the methods students' availability		
Assigned to one of five random area schools across 17		All candidates assigned to c	one school working with either



different teachers (no teacher acclimation). Little supervision (1-3 observations per semester) per student. Little on-site course instruction as most communication was done via email with methods student and cooperating teacher. Candidates were asked to complete a checklist (i.e. observation notes, textbook analysis, etc.), and co-teach a minimum of one lesson plan.	a 10 <sup>th</sup> grade U.S. History teacher or 12 <sup>th</sup> grade Economics teacher. By week four, the candidates take full instructional responsibility for Blocks 6 & 7 classes. Candidates put in groups of 2-3 to plan and implement units, which must be approved by methods class, methods instructor, and cooperating teacher before implementation. Class reviews and provides feedback on group units. On-site instruction by professor and cooperating teacher. Candidates expected to build strong rapport with students and teach every day. Outside of completing this clinically intensive experience, methods students are required to complete on-line modules which helps prepare them with additional pedagogical content knowledge.

10<sup>th</sup> graders at this urban school are teamed, meaning that all 10<sup>th</sup> grade students on a team travel together from teacher-to-teacher. Tenth grade teachers are afforded common planning time and since they have the same students they are well positioned to reach across subject areas to discuss student performance and to plan and implement interdisciplinary units. The university methods professor and teacher candidates often attend 10<sup>th</sup> grade team meetings when possible. In the past, social studies methods students and their professor have teamed with English Language Arts university methods students and their professor (who have previously engaged in this lived-in model) to plan and implement a 10<sup>th</sup> grade interdisciplinary unit (Global Education and STEM) at the high school. Unfortunately, teaming is not a part of the 12<sup>th</sup> grader experience, which makes cross-curricular collaboration and interactions in Economics more difficult.

Throughout the semester university methods students worked with their peers in teams to plan, construct, implement, and reflect on instruction in their discipline. In the first week, methods students were presented with the required units to be implemented, as selected in consultation with cooperating teachers. 2-3 methods students were assigned to a unit and these two-week units include such topics as the Great Depression, WWII, Cold War, and U.S. in the World Today. All draft lesson plans and instructional materials were shared amongst the class for on-line peer review and comment a week ahead of time, and final documents used the day of instruction were housed 48 hrs. ahead of time in an on-line master calendar. Methods students were responsible for all instructional tasks, with instructor supervision, such as making copies, taking attendance, grading papers, and entering student grades.

While groups rotated in their planning and in implementing units, all methods students were responsible for teaching high school students in class each day. High school students worked individually and in small groups with methods students, which allowed for differentiated and individualized instruction-all of which would be more difficult with just one teacher delivering whole class instruction. Methods students at the start of the semester were also paired up with 2-3 secondary students they consistently mentored, tutored, and worked with over the course of the semester. High school students looked forward to seeing and working with their university methods students, and at times, rich trajectory changing relationships were forged.



After five years of implementing this lived-in model to teacher preparation, Author 1 has observed the significant impact it's had on secondary students- some of whom were the most academically vulnerable. While on site, it is commonplace for 10<sup>th</sup> and 12<sup>th</sup> graders we worked with to approach Author 1 to tell him how a university methods student inspired them, taught them, and made a difference. Author 1 has observed a change in both high school and social studies method students' classroom performance, as this authentic learning environment enlivened classroom discussions. With so many trained, competent, and caring adults in each social studies classroom, youth looked forward to coming to class and feeling special with all the individual attention they received. Building on this approach, Author 2 was invited to implement special education methods courses within the district.

Special Education Methods

Stakeholders in the teacher preparation program collaborated to implement advanced academic and behavior methods courses for students with mild-to-moderate and moderate-to-intensive disabilities. The stakeholders included the middle school principal, Author 1, Hal Foster, multiple classroom teachers, intervention specialists from the district, and special education administrators. The district team identified classrooms in need of support and cooperating teachers willing to provide guidance to pre-service teachers in special education. These courses were:

- 8<sup>th</sup> Grade Social Studies with Cooperating Teacher 1
- 8<sup>th</sup> Grade Science with Cooperating Teacher 2
- 8<sup>th</sup> Grade English/Language Arts with Cooperating Teacher 3
- 5<sup>th</sup> Grade Science with Cooperating Teacher 4
- 5<sup>th</sup> Grade Science with Cooperating Teacher 5

Under this model, all teacher candidates enrolled in special education methods (grades Pk-12), for students with mild to moderate disabilities (4 credit hours) and its co-requisite field experience were required to be on-site at an area urban middle school Monday and Wednesday from 9:00 a.m. until 11:30 a.m. This requirement resembled the requirement Hal Foster had for his Secondary Language Arts methods students (Foster & Nosol, 2008). Our university course schedule was based upon the teachers' and middle school's block bell schedule. This timeframe worked well as it provided the methods students and Author 2 the opportunity to debrief on their teaching with the cooperating teachers at the beginning and end of the classroom block. See table four below for delivery details.

Scheduled time	Pre-service teacher activity
9:00 - 9:30 a.m.	University classroom briefing on the lesson of the day in
	dedicated classroom
9:30 – 11:00 a.m.	Implementation of lesson and co-teaching methods
11:30 – 12:00 p.m.	University students debrief and discuss what to expect
	for next class
12:00 – 1:00 p.m.	Pre-service teachers in special education provide one-to-
	one instruction as needed with mentor student
12:00 – 1:00 p.m.	Author 2 meeting with cooperating teachers regarding
	progress, projects and scheduling issues

Table 4: Schedule used for "lived-in" model - Special education, Mild to Moderate

Under this lived-in model Author 1 and Author 2 invited cooperating teachers to work alongside them on-site to promote collaboration and sustain communication.

Pre-service teachers researched and planned units of instruction for implementation for two morning periods in their cooperating teacher's classroom. In the first three weeks, methods students became acclimated to the school, built relationships with their middle school students, are were issued copies of the curriculum and the students individualized education program goals (i.e. exams, content standards, texts, etc.) and began the process of planning relevant interventions and adaptations to units which were vetted by their methods professor and cooperating teachers. In weeks four through sixteen, pre-service teachers took over all instructional responsibilities for middle school students in need of remediation or Tier 2 intervention based on the Response to Intervention (RTI) model. All units were required to incorporate technology and high leverage practices to assist students with learning difficulties. Pre-service teachers worked in groups of three in each of the cooperating teacher's classrooms.

Each group of three pre-service teachers was required to complete lesson and assessment plans that matched the curriculum goals of the classroom in a format that would prepare them for educational teacher performance assessment (edTPA). Pre-service teachers were also presented with instruction on high-leverage teaching practices (TeachingWorks), evidence-based practices in special education (Ohio Department of Education and the Employment First Initiative), and research-based practices in special education (National Technical Assistance Center on Transition). This instruction was delivered face-to-face and supplemented with instructor made video recordings. The following projects were implemented in the Fall of 2016:

- Creation of self-correcting materials in social studies and science
- Creation of guided notes and graphic organizers for ELA and science
- Creation of educational games for social studies
- Creation of visual supports for vocabulary in science The project stakeholders agreed that implementing one group of students (SPED Methods for students with

mild/moderate disabilities) in the Fall of 2016 would be appropriate as Author 2 learned the logistics of the district and the needs of the cooperating teachers. However, the following spring semester of 2017, an additional group of pre-service teachers (SPED Methods for students with moderate/intensive disabilities) were moved into the middle school model.

Under this newer model, beginning in spring semester, all teacher candidates enrolled in special education methods (grades Pk-12) for students with mild to moderate disabilities (4 credit hours) and its co-requisite field experience were required to be on-site at an area urban middle school Monday and Wednesday from 9:00 a.m. until 11:30 a.m. All teacher candidates enrolled in special education methods for students with moderate to intensive disabilities (4 credit hours) and its co-requisite field experience were required to be on-site at an area urban middle school Monday and Wednesday from 9:00 a.m. until 11:30 a.m. All teacher candidates enrolled in special education methods for students with moderate to intensive disabilities (4 credit hours) and its co- requisite field experience were required to be on-site at an area urban middle school Monday and Wednesday from 11:30 a.m. until 2:30 p.m. See table five for dual class delivery details.



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Scheduled time	Pre-service teacher activity
9:00 - 9:30 a.m.	University Classroom briefing on the lesson of the day
	in dedicated classroom
9:30 – 11:00 a.m.	Implementation of lesson and co-teaching methods
	mild/moderate
11:30 – 12:00 p.m.	University students debrief, and discuss what to expect
	for next class
12:30 – 2:00 p.m.	Implementation of lesson and teaching methods
	moderate/intensive
12:00 – 3:00 p.m.	Pre-service teachers in special education provide one-
	to-one instruction as needed with mentor student
12:00 – 3:00 p.m.	Author 2 meeting with cooperating teachers regarding
	progress, projects and scheduling issues

Table 5: Schedule used for "lived-in"	'model-Special education, Mild/Moderate &
Moderate/Intensive	

At the beginning of the semester, special education methods students became familiar with the primary goals and principals of the lived-in model. Throughout the semester university method students worked in teams to plan, construct, implement, and reflect on instruction in their discipline. In the first week, methods students were presented with the required units to be implemented, provided instruction in edTPA formatting and planning, IEP construction and implementation, and a curriculum topic to plan as selected in consultation with cooperating teachers. Author 2 provided access to instructional videos and materials for the semester using Live Binder and a YouTube Channel. As the class moves from campus to the middle school setting, SPED methods students were responsible for remedial instructional tasks, co-teaching with some supervision, and some teacher duties such as making copies, taking attendance, grading papers, and behavior management.

The implementation of both advanced special education methods classes provided a unique opportunity. There is a significant overlap between the educational needs and experiences of a pre-service intervention specialist for students with mild to moderate disabilities (MM) and a pre-service intervention specialist for students with moderate to intensive disabilities (MI). Under this model, students can interact with students across the continuum of classroom placements and experience RTI. The school setting offered inclusive settings in core academic subjects (Tier 1), resource rooms for alternate and functional skills curriculum (Tier 3), and small group intervention with grade level tutoring (Tier 2).

After one year, which included three cohorts of pre-service intervention specialists, of implementing this lived-in model to teacher preparation, Author 2 has observed a significant impact in student performance. Educational teacher performance (edTPA) assessments have increased across two cohorts, the third will be assessed in the Fall. Although the sample size was small (n=13), scores increased from an average of 32 to an average score of 43. This included four students that scored 50 or above. Students reported feeling better prepared to meet the challenges of student teaching as well as for their first teaching position. Author 2 also observed a positive impact on the middle students. Teachers that participated in the program observed a reduction in behavioral issues and an increase in assignment completion.

## CONCLUSION

This paper described how two methods instructors, one in secondary social studies and the another in Pk-12 special education, successfully employed lived-in models that embedded teacher preparation in real classrooms, all in an attempt to better prepare the next wave of teachers while also empowering them to deliver individualized and high quality instruction to some of our area's most vulnerable urban youth. While there were slight differences in the ways in which these models were employed by the methods professors (i.e. the number of hours logged by methods students, subject and grade areas, etc.), both courses lived-up to the core lived-in principals presented by Foster & Nosol (2008). These included:

- 1. Focusing on developing "strong" high school students (i.e. providing an advanced and meaningful curriculum, motivating and supporting academically vulnerable students, etc.)
- 2. Engaging in long-term, sustained relationships with middle/high school students over the course of the semester. This included methods students building strong rapport with students, individualizing and differentiating instruction, helping youth feel welcomed and more visible in the classroom, and in building and maintaining a professional and powerful pre-service teacher to middle/high school-student relationship.
- 3. Consistently reflecting on the quality of instruction, with their peers, cooperating teacher, and university methods professor, provided to middle/high school students, and adjusting their instruction and interactions where and when necessary to meet the needs of students.

Knowing that subject specific methods courses are at the core of advancing essential

pedagogical content knowledge (Kenyon, 2013; Adler, 2008; Henning & Yendol-Hoppey, 2004; Toll, Nierstheimer, Lenski, & Kolloff, 2004; Passe, 1994), we believe that a lived-in model to methods courses help pre-service teachers experience supportive, relevant, authentic, and rewarding field experience in real classrooms working with academically vulnerable youth. Methods courses often come before pre-service teachers progress into full-time student teaching, and lay an important foundation of pedagogical content knowledge (Doppen, 2007). Outside of helping methods students learn about practice in practice (Ball & Cohen, 1999), this lived-in model aligns well to CAEP's call for university teacher preparation programs and their faculty prioritizing and investing in initiatives that allow teacher candidates the opportunity to learn and train alongside university faculty in schools (CAEP, 2013).

While the discussed lived-in model could be considered a low-cost win-win for both university teacher preparation programs and Pk-12 schools, we understand that this model does come with both opportunities and challenges. In the future, we hope to be able to provide methods students and faculty with additional opportunities working across subject areas (special education, math, science, social studies, language arts, etc.) while learning in schools. These opportunities are not as prevalent in the middle and high school as we would like as methods professors. While it's true candidates invest a great deal of time and effort in classrooms over the course of the semester to learn how they are organized and structured, it is also true these efforts in practice take time away from candidates reflecting on how classrooms, learning environments, and the teaching profession could be better reformed and structured. Methods students must not simply be able to regurgitate current practices and the status quo, but draw from their experiences and reflections, across many different placements, to think critically and work towards the transformation and creation of inclusive and successful learning environments. Finally, with methods courses being embedded in schools, pre-service teachers and faculty must remain flexible (i.e. assemblies, fire-drills, school delays/cancelations, etc.) while also understanding the necessary transportation and time commitments for travel to and from schools.

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# Magic of Storytelling in Education for Preschool Children about Classical Music

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# ABSTRACT

Glazbaonica Ljubav (Music school "Love") is a private music school imagined as a humanitarian-art project aimed at providing a complete musical education to children and the youth with special attention to children without adequate parental care placed in homes for abandoned children in Zagreb. The main priority is breaking prejudice about education and preventing outcomes that pressure puts on a child's psyche often creating unwanted reactions in lives of individuals as well as society as a whole. The youngest learners are taught content by using the storytelling approach which is shown to be the best way for acquiring content at that age. The main outcome is not just memorizing facts, but structuring it - the child needs to form a rich and flexible model of reality which is going to represent a general assuredness about the world and music. The content is shaped to accommodate practical life in which children practice it. One of the programs created in Glazbaonica is The Music animations. It introduces music and the basis of music theory to preschoolers (3.5+) through other arts, general knowledge, stories and representations of notable composers and their most famous musical works, ending in performing a piece of music.

## INTRODUCTION

When going through their educational process, children form a negative attitude towards the content material not because of the material itself, but because of the manner in which it is presented to them. One such area is classical music which isn't comprehensible to many because of their lack of knowledge and understanding of music. The approach in teaching classical music in Music school Love is based on the decision to provide understanding through educating children in music theory in an interesting way which is why different creative methods are implemented in the manor the school method, with emphasis on functional, rather than on reproductive knowledge. The private music school Music school Love is imagined as an educational-humanitarian art project, with the intent of providing a comprehensive musical education to children and the youth, with special regard to those without adequate parental care who are placed in homes for abandoned children in Zagreb.

The main priority in this school is to break every prejudice about education and its results that are attained necessarily by applying pressure on the child's psyche, later often leading to unwanted outcomes in the life of the individual as well as in the entire society. Storytelling is greatly used in teaching very young learners. In that way children acquire knowledge the fastest and enjoy the process. The primary role of learning in preschool age should not be only memorizing isolated facts, but building a structure. The child should form a rich and flexible model of reality which would represent their global belief structure of the world, nature, society, man and, of course, music. The entire content is always in correlation with practical life, making children able to apply acquired knowledge in their everyday life, meaning that after a few months they say that they have sneezed "forte" or yawned "piano".

One of the special programs, developed in the Music school Love, are Music animations. Music animations are a program of music education for preschool children aged 4 and above in which they enter the world of music using other arts (theatre, visual, dance). They acquire general knowledge elements through stories of composers and music works (e.g. Mozart/The Magic Flute, Debussy/Clair de Lune, Tchaikovsky/The Nutcracker, Vivaldy/The Four Seasons...). They also acquire fundamentals in music theory and they master basic rhythms though rhythm dictations presented through games, placing notes into a staff, using solemnization, music scale... In the third stage of Music animations they play on Orff instruments and attempt composing simple melodies.



This paper will present the school, its values, tasks, goals and methods. More specifically, it will present classes performed in Music school "Love" with kindergarten children aged 4-7, which were observed in the previous school year. The focus was on the methods used in class and on the nature of pupil and teacher activity. The observed classes were recorded and video extracts and images depicting didactical material are implemented in the paper below.

## THE SCHOOL

The private music school Music school Love is an educational center with a music profile dealing with teaching music and music expression, with programs intended for preschool and school-aged children. The Music animations 1,2 and 3 programs are intended for preschool children aged 4 to 7, with the goal of sensitizing children for music, more specifically, for listening to classical and traditional music and for singing, playing an instrument, dancing and creating music. After the third year of attending Music animations pupils are ready to enroll elementary music school. Classes are held one hour once a week (60 minutes), along with group visits to music institutions such as the Croatian National Theatre, The Music Academy and the Croatian Music Institute and attending selected concerts and plays in professional theatres as well as visits from prominent musicians to the school. Common praxis are improvisation on various instruments among children and between children and mentors where the mentor is the group leader. Classes are organized in a rented space. There is a piano in the central classroom and in other classrooms there are synthesizers, an electric piano, a CD player, a transportable computer, as well as Orff instruments and bas resonators. The didactical material varies according to lessons: story books, portraits of great composers, illustrations of scenes from their lives, cardboard keyboards, stick dolls and marionettes, masks, coloring books, a folding castle, handy instruments made of used packaging, etc.

The culture of the school is given much attention to. Teaching values is integral to the process and much attention in the team is dedicated to the school atmosphere because of its influence on the process of education. The values are not only taught, but a point is made for them to be upheld among the staff and children in order for them to acquire them implicitly (Spajić Vrkaš, 2008). Considering that music is extremely transcendental, music education is therefore very apt to being combined with real life values through which children are brought up with a focus on love. The education is comprehensive in that way, whereby covering the topics of certain composers' childhoods, issues such as bullying are being covered. And considering how music is innate in every person regardless of whether they can reproduce it well or not, it is possible for children to become interested in classical music through education and with the help of the mentor who transfers both knowledge and genuine life values. A goal within that frame is to bring education to a larger group of children from different backgrounds in a manner in which art would be defended with a culture of decorum.

The approach towards children is not ex cathedra. The lessons are student-centered, interactive and connected to the pupil's practical lives and life experiences in order to help them develop their critical thinking, problem solving skills, collaboration, creativity, inventiveness and empathy (Overby, 2011). The teacher is only an active facilitator in a group who stimulates them by using the Socratic Method, leading the children to answers through an active debate by using questions. Conclusions gained in such a way are very meaningful to children as they are incited to find their own way to answers (Reich, R. 2003).

A part of the school's work is based on the Orff pedagogy. Importance is given to movement, improvisation, exploring sound, rhythm and creativity in a way that is natural, understandable and meaningful to the child (Jorgenson, 2010). Movement, as one of the basic forms of expression, is used to help understand and interpret rhythm and emotion conveyed by music (Wuytack, 1994). Children's rhymes are used as they integrate speech and language, they are short, simple and motivating, but are also beneficial for the overall development of the child, they can specifically help develop its movement and imagination, and help the child form values and acquire important information (Jorgenson, 2010). The school uses Orff instruments appropriate for children, which consist mostly of percussion, as they are seen as a natural extension of producing rhythm with movement (Goodkin, 2001). Recorders are also used by children imitating the teacher's melody line by ear (Jorgenson, 2010).



#### EDUCATIONAL TASKS AND GOALS

The educational tasks and goals include introducing the children to elements of music theory, different instruments, acquiring basic music vocabulary (e.g. from the areas of rhythm and dynamics); training children to relax and emotionally unburden by listening to music, dancing, playing an instrument, singing or composing; gradually forming of personal criteria for moral values and esthetics.

#### METHOD OF ATTAINING GOALS AND TASKS

In the Music animation program the educational process and the results of the process are equally insisted upon. The goal is to satisfy the children's inherit desire for attaining knowledge in a relaxed and cheerful, but firmly structured way and to develop a sense that learning is joy and that school is a pleasant place to spend time and attain new knowledge and skills. Every class in Music animations is structured so that 20 to 30 percent of the time is dedicated to acquiring elements of musical literacy (e.g. notes, staff, music keys), a further 20 to 30 percent is singing and playing an instrument and 50 to 60 percent is dedicated to listening to music and performing activities connected to a specific music lesson. The planned activities are interdisciplinary and correlate with many areas (visual arts, dance, movies and physical exercise) and they are performed before, during and after listening, which will be presented in extracts from lessons below.

Stories are a part of each lesson. They consist of anecdotes from the lives of great composers and of simplified opera content (e.g. Rossini's Wilhelm Tell and Mozart's Magic Flute). The stories are specifically designed to enable children to vividly experience certain works of music, e.g. Debussy's Clair de Lune, Saint-Saëns' The Carnival of the Animals or Vivaldi's Four Seasons. Information connected to a story is remembered more easily. Apart from that, stories have a strong motivational power and they can serve as an excellent calming device and for reaching a relaxed atmosphere in class. The amount of importance that this music school gives to stories is visible from the fact that the famous Croatian children's writer Željka Horvat-Vukelja, a famous author of many storybooks and children's readers and well-known story teller, teaches in all the groups of Musical animations. As a result of combining music and stories, i.e. making music and telling stories in a specific way, a new musical-scene form was created in the school for which a new Croatian word was created: glazbokaz (musictelling). The form is performed by an adult storyteller telling a story to the children, making pauses for them to finish a sentence, answer a question or make up the ending to the story. Musictelling consists of talking, singing, playing an instrument, giving a beat or dancing. Musictelling is appropriate for performances in school plays and its every performance varies from the previous.

#### **EXAMPLES**

#### JOHANNES BRAHMS: LULLABY

In this lesson pictures depicting the childhood of Johannes Brahms were placed on the walls in front of the children. They were told anecdotes from the composer's childhood and youth with their focus being on the picture on which little Brahms lied in bed after an accident, while his mother was reading and singing him a lullaby (Figure 1) (Reich, 1994, Deuchter, 1964). Brahms' lullaby was played to the children on the piano, then on the flute. The lyrics of the lullaby were acquired through rhythmical repetition and then by singing. The pupils listened to the lullaby in the classroom with dimmed lights in complete silence, while they lay on the tables covered with blankets, imagining that they were lying in beds (Video 1).





# PYOTR ILYICH TCHAIKOVSKY

The topic of ballet and Tchaikovsky was covered in three lessons. The pupils listened to the story of the dandelion and the dandelion ballerina and compared the dandelion's white "dress" to the ballerina's white costume (Figure 2).



Figure 2

They listened to the "Flower Waltz" from Tchaikovsky's ballet "The Nutcracker" twice, the second time performing the dance with wooden marionettes (Figure 3, Video 2).





The teacher provided information about the ballet and showed the positions and figures that the pupils tried to perform (e.g. the arabesque), and to get an insight into how physically demanding it is to dance ballet. By listening to Tchaikovsky's ballet music (from the "Swan lake"), pupils looked at the reproductions of paintings by Edgar Dégas who became famous though his paintings from the world of ballet (Figure 4).



# Figure 4

In the following activity, the pupils got images in the form of a puzzle. While they solved the puzzle, ballet music was playing for them in the classroom (Figure 5).





The storyline of "The Nutcracker" was presented to the pupils, during which time the storyteller used cardboard puppets made for that purpose (Figure 6).



Figure 6

Finally, pupils listened to carefully chosen parts from "The Nutcracker" (e.g. the dance of the Sugar Plum Fairy).

# GIOACCHINO ROSSINI: THE CATS DUET

A writer and teacher told the story of cats and mice in the opera, using mouse puppets. The story was especially written for Music Playroom Love (Figure 7).





Pupils listened to "The Cats duet" while a big fleece cat in the hands of their teacher went around them and touched them one by one. They listened to "The Cats duet" one more time and danced with paper cat masks (Figures 8 and 9, Video 3).



Figure 8

Figure 9

## LUDWIG VAN BEETHOVEN: LULLABY "SLEEP, LITTLE FISH"

A writer and teacher told the story of a lost fish written for Music school Love. Pupils listened to the song performed on piano, then again by rhythmically waving a light fabric representing waves (Video 4). Pupils learned to sing the song alongside the piano. They listened to the song again from a CD recording, "sleeping" on their desks while the teacher touched them with a light (lightly perfumed) scarf, which was intended to represent the dream coming down with the dark (Video 5).



## ANTONIO VIVALDI: SPRING

The pupils were shown an illustrated story with the topic of spring, written and painted for this occasion. The pupils listened to "Spring" from a CD and guessed which instruments were playing. They took wooden spoons, held them like violins, violas and violoncellos and "played" Vivaldi by looking at an enlarged copy of the original music sheet (Video 6). The entire time that they were listening to "Spring", a reproduction of Sandro Botticelli's "Primavera" was placed in view for the children to see (Figure 10).



#### Figure 10

The teacher explained who the picture represented. At the end of the class there was relaxation: the pupils worked in coloring books (Figure 11), while still listening to "Spring".



Figure 11



## CONCLUSION

In its preschool programs, Music school Love wants to develop musical literacy in its pupils in an interactive, imaginative and joyful way and motivate them to learn to love music and to make them active musicians or at least appreciate good music. By using an interdisciplinary approach, in correlation with other forms of art and though visiting musical institutions and meeting prominent musicians, Music school Love helps children to form their own taste in music from a very early age and makes music a permanent accompaniment in their lives, making them nobler and spiritually wealthy.

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# Matching/Mismatching of Teaching and Learning Styles; And its Effect on Students' Academic Achievement at Tertiary Level

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## ABSTRACT

The overall purpose of the study was to explore the effect of matching/mismatching of teaching and learning styles on academic achievement in higher education. The study was causal comparative in nature to study the cause and effect relationships between matching/mismatching of teaching learning styles and students' academic achievement. The sample for this study, selected through multistage sampling design, consisted of 120 teachers and 240 students of BS-4 year program in four disciplines (Physics, Chemistry, Botany and Mathematics) from six public sector universities of Khyber Pakhtunkhwa, Pakistan. Felder-Solomon Index of Learning Style (FSILS) was used for the identification of learning styles of students while Teaching Style Instrument developed by Letele et al. (2011) was used to identify teachers' teaching styles. These styles of students and teachers were then analyzed to see if they matched or mismatched. The results showed that Visual learning style was the most favorite learning style followed by Abstract and Sequential teaching styles. Group statistics indicated 42.75% matched cases and 57.25% mismatched cases. T-test for independent samples revealed that the students with matched learning styles performed significantly better than students with mismatched learning styles. In the light of these results, recommendations were forwarded for teachers, students, educationists, researchers and policy makers. *Keywords:* Matching, Mismatching, Teaching Style, Learning Style, Academic Achievement

Matching/Mismatching of teaching and learning style has proved to be somewhat divisive subject in research cultures as there are research findings that favor the idea of matching and those that do not (Ford & Chen, 2001). According to Coffield et al. (2004), nine research studies found learning to be more effective when there is match while the same number of studies favored the idea of mismatch. According to Larkin-Hein (2000), the teacher who teaches in the classroom keeping learning style of students in view and uses various strategies to cater for all the students, results in improved conditions in terms of interest, motivation and academic performance.

This study is planned to determine the influence of matching/mismatching on students' performance regarding their academic achievement. Matching/Mismatching illustrates the extent to which students' learning style preferences are similar/dissimilar to teachers' instructional style preferences indicated by the two questionnaires in the study. Academic achievement is defined as "the attainment of knowledge, competencies, and higher-level status, as reflected in grades, degrees, and other forms of certification or public acknowledgment" (The Greenwood Dictionary of Education, 2011). For this research study academic achievement is the mean score attained by the student at the end of semester examination in the subject taught by the teacher participating in the study.


## LEARNING STYLES

The Cambridge Advanced Learner's Dictionary (2008) defines style as "a way of doing something especially typical of a person, group of people, place or period". In the context of education, a teaching style may be defined as "methods, procedures and strategies in instruction and interpersonal relations that have developed and matured through years of personal and professional experience" (The Greenwood Dictionary of Education, 2011). According to Grasha (1996), teaching style is a combination of manners, tactics and behaviors inherent in the personality of a teacher that immensely influence the teaching learning process.

To date, various definitions of the term learning style exist in research literature. Learning style is described and interpreted in many different ways depending upon one's conception about the term. Some consider it to be relatively stable while some are of the opinion that learning styles have a complex nature and varies according to the context of teaching learning process. These different ideas of learning styles have given birth to various different definitions. "The term learning style refers to the general approach preferred by the student when learning a subject, acquiring a language, or dealing with a difficult problem."(Oxford, 2003, p. 273) According to Ellis (2001), learning style is a consistent way of a person's perception, conceptualization, organization and recalling information. It is the composite of cognitive, affective and physiological behaviors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment (Keefe, 1979). Learning style also tells about the ways a person learns from and adapts to environment, and how a person's mind operates (Gregorc, 1979). Curry (1990) categorizes learning into four dimensions just like the four layers of an onion namely personality traits, information processing, social interaction; and the instructional environment and students learning preferences. Felder and Solomon (1996) developed a learning style instrument called the Index of Learning style. Initially this instrument comprised five dimensions namely Processing (Active/Reflective), Perception (Sensing/Intuition), Input (Visual/Verbal), Organization (Inductive/Deductive) and Understanding (Sequential/Global). Later the organization dimension Inductive/Deductive was dropped from the instrument and presently it consists of four dimensions each with 11 items forming a total of 44 items each having dichotomous nature with two opposite poles.

Active and Reflective learners: Active learners learn best when they are engaged in learning process actively by generating discussion, applying and understanding information through sharing it with others i.e. peers, adults and group members. They enjoy group study and activity based learning while reflective learners like to work alone and think about a problem quietly first before getting physically involved. Listening to lectures and taking notes is greatly favored by reflective learners while disfavored by active learners.

Sensing and Intuitive learners: This dimension was developed on the basis of Jung's theory of psychological types in which sensing and intuition are the two ways through which people perceive the outer world. People with sensing learning style gather information through senses while people with intuitive style perceive things indirectly by the way of unconscious i.e. speculation, imagination, hunches etc. Sensors prefer data, facts and experimentation whereas intuitors prefer theories and principles. Sensors mostly rely on standard methods for solving problems through step-by-step procedure and they do not like wonders. On the other hand intuitors dislike repetitions and like innovations. Sensors prefer factual where as intuitors prefer conceptual information. (Felder and Silverman, 1988) Visual and Verbal learners: People receive information in three ways called sometimes modalities, visual-----sights, pictures, charts, diagrams, symbols; auditory----sounds, words; kinesthetic -----taste, touch and smell. Visual learn best when materials are presented in diagrams, flow-charts, images, films and demonstrations. Contrary to visual learners, verbal learners like spoken and written information in the form of lectures. They memorize those information best which they hear and then explain it to others.



Sequential and Global learners: Sequential learners understand best when problems are solved in orderly and linear steps; global learners solve problems in large heaps but cannot explain how they came up with the solution. Sequential learners are strong in analysis and convergent thinking whereas global learners are best in synthesis and divergent thinking. Sequential learners would like the problem to be solved in small incremental steps where precise, detailed and orderly sequence is involved, on the other hand global learners like situations where information are presented in a holistic form without enough details

## TEACHING STYLES

Teaching style is formed on the basis of various distinctive teaching behaviors, approaches and strategies that are applied in promoting students' learning (Darkenwald, 1989). Teaching styles is the collection of various instructional approaches used by the teacher with ease and comport; and is highly related to the context of learning rather than the content. (Conti, 1989) As described by Hoyt and Lee (2002) teaching style is the amalgamation of a range of instructional approaches while instructional approach is a combination of different teaching methods. Kaplan and Kies (1995) specify teaching style to be a method specific to teacher personal behavior and the media that teacher use to covey and get information. One's teaching style is the result of the way one learnt and not the way he/she was taught (Dunn and Dunn, 1979). For Zinn (1990) teaching style is based on the teaching philosophy and value system held by the teacher regardless of the method and material. According to Grasha (1996) teaching styles characterize a belief system along with the needs and behaviors that teachers display in class-rooms.

According to Felder and Silverman Model of Teaching (1988), a teacher may either emphasize concrete, factual information or abstract, conceptual and theoretical information. A teacher may either present information through pictures, diagrams, demonstration or it may be verbal through lectures, reading and discussion. A teacher may either encourage students to actively participate in discussions and activities or remain passive simply watching and listening. Lastly, a teacher may prefer a sequential mode of presenting the material in a systematic manner; or they could prefer to present a global picture first and then proceed to break it down.

#### MATCHING/MISMATCHING OF TEACHING AND LEARNING STYLES

The need for investigating teachers' teaching styles and learners' learning styles is felt to avoid mismatches in style between teachers and learners (DeBello, 1990; Larkin-Hein, 2000; Zhenhui, 2001; Dasari, 2006; Graf et al. 2007; Alaka, 2011; Letele et al. 2013). The teacher ought to assist students in identifying their learning styles for building their confidence and making teaching learning process more effective (Doyle and Rutherford, 1984; Hoyt & Lee, 2002). Learning style can influence teacher's approach to planning, implementing and evaluating the teaching learning process. The teacher should develop teaching strategies in the light of students' learning preferences to cater for all their needs and to compensate their weaknesses (Herod, 2000).

While research shows that a greater learning occurs when teaching and learning styles match, Felder and Brent (2005) are of the opinion that the teacher should adopt a balanced teaching style to facilitate all the students having diverse learning styles, otherwise, some students will be satisfied while some will feel dissatisfied with the instructional process.

Making teaching congruent with the learning style of students is well supported by the case study of a teacher teaching English to the 11<sup>th</sup> grade students as described by Dunn (1996). In this study it was evident that the score of those students who had been taught the curriculum in accordance with the learning style of students was relatively very high as compare to those students who had been taught in the traditional way.



The concept of teaching, with learning style in view, is getting popularity across all disciplines particularly in the fields of Engineering and Physics. In a study, Tobias (1990) reported that the failure and dropout on the part of the students in science education in most of the cases were caused by the instruction not congruent with the students' learning styles. In this study he also noticed that a match between the styles of students and teachers give positive results in terms of students' motivation, interest, conceptual understanding and retaining information for a longer period of time. On the contrast, mismatching between students and teachers leads to mistrust, losing interest and even changing to other fields by the students. (Felder, 1993)

Among various scales and instruments used for the identification students' learning styles, the Index of Learning Styles (ILS) developed by Felder and Solomon based on Felder and Silverman learning style model, is the most comprehensive (covering all the essential aspects and dimensions of the learning style), short, valid and reliable instrument (Graf et al., 2007, Felder & Spurlin, 2005). The ILS is a self-report dichotomous scale with four dimensions, each representing two opposite learning styles. Each dimension comprises 11 items forming a total of 44 items. The first dimension Sensing/Intuition is related to how student perceives information. The second dimension Active/Reflective is concerned with the way student processes the information. The third dimension Visual/Verbal is about the way student intakes information and the fourth Sequential/Global is related to understanding and organization of information.

## **Objectives of the Study**

The main purpose of the intended study was to investigate "Matching/Mismatching of teaching and learning styles and its effect on academic achievement at tertiary level. The objectives of the study were:

- To identify teaching styles of teachers at Tertiary level;
- To identify learning styles of learners at Tertiary level;
- To point out matching and mismatching between teacher's teaching style and learner's learning style at Tertiary level; and
- To determine the effect of matching/mismatching between teachers' teaching style and learners' learning style on academic achievement at Tertiary level.

## HYPOTHESES OF THE STUDY

- H<sub>1</sub>: There is significant difference between the mean achievement scores of students with matched styles and mismatched styles in the subject of Physics.
- H<sub>01</sub>: There is no significant difference between the mean achievement scores of students with matched styles and mismatched styles in the subject of Physics.
- H<sub>2</sub>: There is significant difference between the mean achievement scores of students with matched styles and mismatched styles in the subject of Mathematics.
- H<sub>02</sub>: There is no significant difference between the mean achievement scores of students with matched styles and mismatched styles in the subject of Mathematics.
- H<sub>3</sub>: There is significant difference between the mean achievement scores of students with matched styles and mismatched styles in the subject of Chemistry.
- H<sub>03</sub>: There is no significant difference between the mean achievement scores of students with matched styles and mismatched styles in the subject of Chemistry.
- H<sub>4</sub>: There is significant difference between the mean achievement scores of students with matched styles and mismatched styles in the subject of Botany.
- H<sub>04</sub>: There is no significant difference between the mean achievement scores of students with matched styles and mismatched styles in the subject of Botany.



#### **METHOD**

In this study a Causal-Comparative Research design was used, in which data was collected with the help of two questionnaires to achieve the mentioned objectives. In causal comparative design, two groups differing on independent variable (the cause) without manipulation are compared for dependent variable (the effect), to determine cause and effect relationship (McMillan & Schumacher, 1989; Gay, 1996). In this study, independent variable called the cause was the matching of teaching and learning styles and the dependent variable called the effect, was the academic achievement. Learning style, in this study, can be operationally defined as any one of the eight learning styles identified by FSILS. Similarly, teaching style is defined as any one of the eight teaching style questionnaire. Matching/mismatching illustrates the extent to which students' learning style preferences are similar/dissimilar to teachers' instructional style preferences indicated by the two questionnaires in the study. Academic achievement in this study is the mean score attained by the student at the end of semester exanimation in the subject taught by the teacher participating in the study.

#### POPULATION AND SAMPLE

Population for this study consisted of all the teachers and students of 19 public sector universities of Khyber Pakhtunkhwa, Pakistan. A sample of 360 (240 students and 120 teachers) respondents, was selected through multistage sampling design. In the first stage six public sector universities were purposively selected from Khyber Pakhtunkhwa, namely Hazara University (HU), Mansehra, University of Malakand (UOM), Dir (L); University of Peshawar (UOP), Abdul Wali Khan University (AWKU), Mardan; Kohat University of Science and Technology (KUST), and University of Science and Technology Bannu (USTB). From each of these six universities four disciplines or departments namely Physics, Mathematics, Chemistry and Botany; and from each of these departments 10 students and 5 teachers of BS (4-years program) were selected through Stratified and Quota sampling.

#### **INSTRUMENTATION**

The data was collected with the help of two questionnaires to achieve the mentioned objectives. Felder and Solomon Index of Learning Style (FSILS) was used to identify students' learning style while teaching style inventory developed by Letele et al. (2013) based on Felder and Silverman theory of teaching style, was used to identify teachers' teaching style. FSILS has 44 items with four dimensions (active/reflective, sensing/intuitive, visual/verbal, and sequential/global), each dimension with 11 items. Like FSILS teaching style instrument has also 44 items with four dimensions (active/passive, concrete/abstract, visual/verbal, and sequential/global), each dimension with 11 items. All items in FSILS have dichotomous nature with two opposite poles (a) and (b) indicating two learning styles on one dimension with contrasting styles.

Matching/mismatching between teachers' teaching style and students' learning style was conducted according to the following scheme as shown in the table.

#### Table1

#### Preferred Learning Style and Corresponding Teaching Style

Preferred Learning Style	Corresponding Teaching Style
Active/Reflective	Active/Passive
Sensing/Intuitive	Concrete/Abstract
Visual/Verbal	Visual/Verbal
Sequential/Global	Sequential/Global

(Adopted from Felder and Silverman, 1988)



## VALIDITY AND RELIABILITY OF THE INSTRUMENTS

A pilot study was conducted prior to main study, for assessing feasibility of the research procedure, validity and reliability of the two research instruments and any potential flaws in the research study. For this purpose data was collected from a sample of 20 teachers and 29 students not included in the main study. Both the instruments i.e. FSILS(Felder-Solomon Index of Learning Style) and teacher teaching style instrument were validated by the team of experts from IER (Institute of Education and Research) and Department of Psychology at University of Peshawar; and declared it suitable for the said purpose in local environment. The internal consistency test of reliability for both the instruments was conducted with the help of SPSS-17 for the said samples of students and teachers. The Cronbach's alpha values for FSILS obtained in this study were found to be 0.71 for Sensing-Intuitive (Sen-Int) dimension, 0.67 for Visual-Verbal (Vis-Vrb) dimension, 0.65 for Active-Reflective (Act-Ref) and 0.58 for Sequential-Global (Seq-Glb) dimension. In the same way the Cronbach's alpha values for teacher style instrument turned out to be .687 for Concrete-Abstract, .634 for Active-Passive, 0.72 for Visual-Verbal and 0.578 for Sequential-Global dimension.

## DISCUSSION

The findings of this study is in line with the findings of various other researchers like (Zenhui, 2001; Tamimi & Shuib, 2009; Felder and Silverman, 1998) who came up with similar results in their studies where majority of learners were reporting Visual style as their most dominant learning style. Zenhui added that Visual learning style was popular among most of the Korean, Japanese and Chinese Students. Similarly a study conducted by Moallem (2007) revealed findings similar to this study who also found that percentage of students with Visual style was the highest.

The most important finding of the study that matching-mismatching of teaching-learning style do affect the academic achievement of students positively, is in complete agreement with the findings of the studies conducted by Letele et al. (2011), Dasari (2006), Ford and Chen (2001), Fazarro, D. E., Pannkuk, T., Pavelock, D., & Hubbard, D. (2009), Charkins, O'Toole, Raines (1978), and Honigsfeld & Dunn, (2006). As findings of this study revealed that matching of teaching-learning styles had a positive and mismatching a negative impact on academic achievements of students, is well supported by Felder and Brent (2005). In contrast, the study conducted by Spoon and Schell gave contrary result where mismatched students outperformed the matched students. Similar results were also reported by Terry (2001), Scerba (1979), Ruhnau (2006) and Campbell (1989) where matching of teaching-learning had no or very small impact on students' performance. The findings of this study is also inconsistent with the study of Spoon and Schell (1998) who reported in their study that academic performance of incongruent students was better than that of congruent students in adult basic skills classes. One possible cause of these contrasting results may be the factors like culture, environment, prior experiences, students' effort, disciplines, history and other physical and psychological factors related to students and teachers. Among other possible causes for these contrasting results might include various learning and teaching style instruments, research methods and samples. However, one thing is evident that matching of teaching and learning styles results in greater satisfaction, motivation and self-efficacy on both the part of students and teachers (Felder and Brent, 2005; Larken-Hein, 2000; Peacock, 2001; Spicer, 2004).

## CONCLUSION

Research findings revealed that Visual learning style was the most dominant learning style used by majority of students followed by balanced and mixed learning styles. In case of teachers, after Visual style, the mixed and Sequential were the most preferred teaching styles used by most of the teachers. Analysis of data regarding matching-mismatching of teaching-learning styles revealed that the percentage of students with mismatched styles was higher than percentage of students with matched styles. Most importantly, from over all data analysis it was concluded that there was a significant difference between the mean scores of matched students and mismatched students; and that the mean score of matched students was significantly higher than the mean score of mismatched students.

Tables of data analysis available with authors



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# **MAVIS: Special Education Virtual Assistant**

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## 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 (Dizik, 2011)<sup>.</sup>

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.

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 can 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 predefined 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.

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 (Meyer, 2016).

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 (Elgan, 2016). 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 (Brooth, 2014).

Ljubojevic (2014) 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 (2014) 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 (2014) 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 (2012) 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 (2016), 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, Hycy (2012) 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 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				

# Table 2. Respondents of the Study

## **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

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: Testing and Operating Procedure Schedule**



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 preschoolers 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 where 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.

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# Means of Increasing Attention Level in Primary Education

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## ABSTRACT

Children's attention is one of the significant factors influencing the process and efficiency of learning. In our research, we dealt with the effectiveness of attention training, which was created in order to improve children's attention control at the primary level of education. Our training program consisted of exercise series, which selected group of nine-year-old children (N = 8) worked on regularly for the period of two weeks. The training effect (performance improvement) was detected using Bourdon test (BoPr) and Mann-Whitney U test (U = 14, critical value = 0,03288, Z-score = -1,83787, p < 0,05). Our results confirm the need of attention training and the importance of dealing with this phenomenon at schools.

Keywords: attention, attention development training programs, younger school age.

## INTRODUCTION

According to one of the most important psychologists and philosophers of the nineteenth century, William James (1890), attention is the taking possession of the mind, in clear and vivid form, of one out of what may seem several simultaneously possible objects or trains of thoughts... It implies withdrawal from some things in order to deal effectively with others. Hartl (1994, p. 152) defines attention as: "focusing and concentrating mental activity on a particular object or action (for example; listening, in contrast to hearing)". And as he states below, "attention is based on the orientation reflex, and the probability of choosing the stimuli is attributed to their imaginativeness, unexpectedness, novelty, but also the environment, perceiver's attitude, interest, expectation, and fatigue play an important role."

According to Lokša and Lokšová (1999), attention represents a part of a mental activity that enables the selective focus and conscious concentration on certain objects and phenomena. It is an inherent part of perception, thinking and other cognitive processes. Its improvement results in an improvement in any other area of the intrapsychic domain (p. 54). As Chalupa (1970) suggests, attention consists of *"a dynamic, regulatory, controlling and coordinative function that can be characterized by selectivity, concentration and focus in human mental activity"* (p. 82)

Generally, attention can be understood as the orientation ability of an individual and his main precondition to familiarity with the surrounding world, objects, and phenomena. Attention enables the individual to focus on the essential stimuli while ignoring the stimuli that are not subjectively important or essential at the moment. There are stimuli that an individual perceives intensively, stimuli, that are perceived less accurately and finally, stimuli that are not perceived at all, depending on their strength, intensity or significance to the individual. In other words, it reflects our ability to choose from a number of surrounding stimuli those that are important to us at the moment, thus enabling an efficient functioning in the surrounding world. This assumption is relevant whether we move physically, or whether we try to capture the necessary information at school, work, or just while watching our favourite TV series or listening to a radio play - none of these activities would be possible without the underlying role of attention.



## ATTENTION DURING THE MIDDLE CHILDHOOD

Attention, as we have already mentioned, is a significant factor influencing the course and effectiveness of learning and cognition in general. "To be able to master the demands of the school, the attention must imply selectivity, as the individual cannot simultaneously perceive all available stimuli while being able to concentrate intentionally which requires also the involvement of attentive processes related to the autoregulation." (Gondeková, 2015).

As noted by Hagen and Hale in their 1976's publication *The development of attention in children*, the ability to determine whether the implication of selective attention is necessary is improving with age. Along with the selectivity, the concentration is also improving in middle-aged children. The ability to concentrate on a specific activity is increasing and at the same time, the sensitivity to distractors is reduced while the ability to differentiate diverse stimuli is improving as well. The child can already focus on a specific activity thanks to its own decisions while being able to perform it for a longer time. However, in the classroom, the instructional activities should vary each 10-15 minutes. In addition, Kostrub (2016) states that teachers often describe learning situations where repeated errors occur, which may be related to the insufficient attention level in the middle-aged children.

In the middle-aged children, there is a great deal of unintentional attention that arises without any conscious effort. It is fastened with sufficient intensity of the stimulus and its distinctive properties. This type of attention is related to incidental learning. As a child matures, a deliberate type of attention and a deliberate way of learning occurs, under the influence of improved ability of self-regulation, will, and self-control. Moreover, the impulse control rate is increasing, as well as the ability to suppress the inappropriate stimuli and focus on the desirable ones - as the basis of selective attention. "A higher level of selectivity indicates a low level of unintentional learning combined with a high level of deliberate purposeful learning." (Hagen, Hale, 1973)

In addition to selectivity, at the end of the period, the ability to suppress automated responses that are considered as irrelevant in the given situation is also enhanced. This ability is an indicator of the existence of executive functions and as they are proportionately improving with increasing age. The development of attention and its functions thus proceeds gradually from the basics of motor control in the early stages of the development, where mainly the form of reactive behaviour is exercised, through the control of impulsivity, related mainly to the emotional maturation; as certain level of this aspect is required when child first enters the school.

During the younger school age, selective attention and concentration, whose development at the end of the period is not yet completed, are improving as well. These are, however, a certain precursor to the continual maturation of executive functions, including the ability of self-regulation. We understand the self-regulation ability in two dimensions. The first concerns mainly the control of emotions and impulses, which is also reflected in the behavioural regulation. It operates mainly at lower levels as the executive functions are not yet fully developed. The latter has a higher function, evolves later and integrates cognitive executive processes such as memory, attention, language, thinking, but also the will, the ability to continually control and correct errors, executive attention functioning, predictions concerning future events, self-control. The second type is termed as the *self-regulation ability*, known as "*effortful control*" in the foreign literature. Rueda, Posner, and Rothbart (2004) formulated a hypothesis by comparing the results of a larger set of studies focused on specific neuronal mechanisms underlying self-regulation, which presupposes a strong link between these behavioural regulation mechanisms and executive attention, resulting in the above-mentioned self-regulation ability.

Rothbart, Ahadi, and Hershey (1994) discuss certain ability of self-regulation (the first type - in our understanding) in 6-7 year olds. Based on their research, they suggest that children at the beginning of a school age with high self-regulation ability also have a high level of empathy, guilt, or shame, along with a lower level of aggression.



Eisenberg et al. (1994) found that boys at the beginning of a school age with a good level of attention control were more likely to cope with the anger by using the non-hostile verbal methods than by direct aggressive alternatives. (Eisenberg, Fabes, Nyman, Bernzweig, & Pinulas, 1994). We understand this similarly to Šramová (2007), that the high level of self-regulation of our own behaviour is related to the level of attention control in the positive sense of the word and also indicates a higher level of self-control, control of emotions and empathy. These children are generally better at adapting to the peer group, are among those who are popular and supposed to achieve better results.

## RESEARCH, RESEARCH METHODS, AND RESEARCH SAMPLE

The present research aimed to assess a program designed to improve the attention on a specific sample of pupils within the school environment. The program was realized during 5 days for 45 minutes, every day at the same time and consisted of the six types of exercises which were varied every day. To the address the training effect, we used Bourdon's BoPr, the psychological test that can be administered to groups of participants (although it can also be administered individually). BoPr belongs to the category of nonverbal performance tests assessing the intentional attention, perceptual accuracy, and psychomotor reactivity. The basic principle of the test is to differentiate (override/underline) the stimuli according to their shape and symbolic similarity over a longer period of time. Participants were administered an "entry" and "exit" BoPr test prior to and after the training.

For the research purposes, we selected eight elementary school pupils of the fourth year. Our main assumption was that the attention after the training would improve, which was later confirmed by the difference between the entry and exit BoPr test scores in all tested participants. The results were statistically verified by Mann-Whitney U test which allows a comparison of two different sample sets (group A and group B) in which normal Gaussian distribution cannot be predicted.

Prior to the realization of the research, we formulated following questions and hypotheses:

1. Participants' performance in the BoPr re-test administered after the training will be higher compared to the performance in the BoPr test administered prior to the training.

2. Participants' error in a BoPr re-test administered after the training will be lower when compared to the error rate in BoPr test run before the training.

#### **RESEARCH RESULTS**

## **Performance appraisal**

The numeric values in Table 1 represent the quantity of correctly resolved responses (correctly underlined or crossed squares) of a maximum of 1190 squares, representing 100% for 14 rows. The average pupil's performance from 6.12.2016, shown in the first column, is **428.62**, which represents **34.87%**. The average pupil's performance from 20.12.2016, shown in the third column, is **528.50**, which represents **44.41%**.

Based on the comparison of numerical values, it is possible to assume that the pupils' performance has increased by the numerical value of **99.88**, which corresponds to **9.54%** improvement. The percentage values concerning pupils' performance are shown in Table 1. In order to provide more detailed results' overview, the graphs with pupils' performance are also displayed below - graph No. 1, and the graphical representation performance and error rate in test and retest can be seen in Graph No.3.

We included the possibility of a test training effect while analysing the data and interpreting the results, but our assumption concerned an improvement in performance at a reduced error rate, which actually occurred.

1 5	3		1	0 /	
	6.12.		20.12.		
	Performance	Error rate	Performance	Error rate	
Pupil 1	31,85 %	0 %	38,23 %	0,43 %	
Pupil 2	35,12 %	0,47 %	37,14 %	0 %	
Pupil 3	39,74 %	0,68 %	58,15 %	0 %	
Pupil 4	39,75 %	0,83 %	52,35 %	0 %	
Pupil 5	27,39 %	0 %	33,78 %	0 %	
Pupil 6	36,22 %	0,92 %	40,42 %	0,62 %	
Pupil 7	28,15 %	1,47 %	41,85 %	0,99 %	
Pupil 8	40,75 %	1,22 %	53,36 %	0,31 %	
Pupils average	34,87 %	0,69 %	44,41 %	0,29 %	

Comparison of the test results from 6.12.2016 and 20.12.2016 (in percentages).

Table 1: Performance and error rate of individuals (in percentages).



Graph No.1: Individual performance of each participant

A graphical presentation of participants' performance provides us with an overview of individual pupils' performance level in both tests. The blue bars display the performance in the first test from the 6.12.2016, and the red column represents the performance from the 20. 12. 2016 in the retest. The graphical presentation clearly shows a significant improvement in the performance of all pupils.

## Error assessment

When evaluating errors, we proceeded with their summation and subsequent conversion to percentages, in relation to the total number of answers solved per pupil (both correct and incorrect). The number of errors compared to the number of solved answers is given in the Table No. 1. The error rate (in percentages) is displayed in Table No. 1 and the graphical representation can be seen in Graph No.2.



Graph No. 2: Individual error rate for each participant, respectively.

The average pupil error rate from 6.12.2016 is **3.12**, which is represented by a value **0.69%** and the average pupil error rate from 20.12.2016 is **1.5**, represented by a value **0.29%** after the conversion to percentages. The average error rate, as mentioned above, indicates *individual's ratio of the number of correct responses*, not the total number of squares 1190 as when assessing the performance. The difference between the values corresponds to the improvement in error rate. The difference represents the value **1.62**, which corresponds to **0.4%** improvement.



Participants' performance and error rate

Graph No.3: Performance level and error rate for each participant on 6.12.2016 a 20.12.2016.

Our assumptions have been verified by a statistical technique for small samples, a Mann-Whitney U test. According to the results of Mann-Whitney U test, the difference between the test and the re-test which corresponds to the value **9.54%** (after averaging) is significant at level  $\alpha = 0.05$ .

Based on the given results, we can assume the probability that only 5 cases out of 100 would deviate from the result.

The formula used to calculate the significance level is  $U = NM \frac{N(N+1)}{2} - \sum_{x_i} Rank$  (x1) N-number of subjects, M-average (arithmetic), p-significance level The calculated value U = 14, the critical value is 0.03288, the Z-score = -1.83787, p <0.05. Therefore, the result confirms the importance of the attention training and emphasizes the need to address this phenomenon in the school environment. The results demonstrated that the hypotheses were confirmed.

H1: Participants' performance in the BoPr re-test administered after the training on 20.12.2016 will be higher compared to the performance in the BoPr test administered prior to the training on 6.12.2016. As the results demonstrate, the hypothesis was **confirmed.** Participants' performance increased on average by **9.54%**.

H 2: Participants' error rate in a BoPr re-test administered after the training program on 20.12.2016 will be lower when compared to the error rate in BoPr test administered before the training, on 6.12.2016. As the results demonstrate, the hypothesis was **confirmed.** Participants' error rate decreased on average by **0,4%**.

## CONCLUSION

As the above-analyzed results suggest, we are aiming to express repeatedly the accentuated need for the experimental study of attention in middle-aged children, as we consider it the main prerequisite for the ability to effectively acquire knowledge, skills or habits.

At the times when the digitalisation of our society is increasing rapidly and moreover, already has left its mark in the school practice, we emphasize the need to improve attention in a non-electronic form, without the effect of a graphic overload. We also believe that the attention-training exercises should become an inherent part of the textbooks in respective subjects, encouraging better memorization and understanding of the learning material. Attention should be exercised continuously during the development of the child in different areas and naturally.

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# Methods and Techniques Used by Turkish Prospective Teachers While Teaching Turkish Wedding-Themed Folk Songs in Tfl

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## ABSTRACT

Folk songs, reflections of cultures in languages, are considered as one of the facilitating factors of learning a foreign language because they are cultural heritage about happenings, common feelings like love, longing, homesickness, national characters and annals. There are several studies on Turkish as a foreign language (TFL) but no study on the place of wedding concept in Turkish Folk Songs was encountered. Therefore, this study aims at investigating any methods and techniques prospective teachers would use while teaching TFL during Turkish lessons. In order to shed light in this subject, 81 wedding-themed folk songs, each of which represents one city in Turkey are investigated regarding foreign language teaching. The research questions are framed in how prospective teachers apply language teaching methods and techniques for wedding folk songs in teaching TFL and how they utilize language skills and activities during teaching process. The results reveal that prospective teachers are sensitive to choose songs but feel limited to find a variety of methods and techniques since they merely focus on vocabulary teaching via words or idioms in lyrics rather than teaching linguistic patterns including morphological, phonological or syntactic ones).

## INTRODUCTION

Tekin (2012) explains "Folk songs are cultural heritage about events happened and results, common feelings like love, longing, homesickness, national characters and annals" (p.306). Even though music is not composed in order to teach any concept, it includes several items to draw attention of people in different manners not only in linguistic patterns but also knowledge regarding the cultural and historical events of the period when they are composed. Hence, music affects people in many aspects such as history, literature, geography etc. In other words, music is a universal language and emboldens each person from different point of view. Therefore, whenever music is integrated in teaching any major, it increases motivation in learning (Eady and Wilson, 2007). To them, music could be utilized as a motivation factor in lessons such as history, science, language and etc. even though songs are not composed as a teaching material, each song includes something to teach not only linguistic patterns but also cultural and historical items reflecting different regional and cultural input. Therefore, it would be easy to consider songs or folk songs in terms of language and culture concepts since they are linguacultural juxtapositions. Keskin (2011) emphasizes that songs are both audial and written materials related to both culture and communication skills thanks to developing approaches in foreign language teaching. Additionally, she mentions "Using songs contribute to the development of a lot of language skills from grammar to pronunciation" (p.378). For instance, Michener Reed and Fishoff (2012: cited in Sidekli and Coşkun, 2014) underline the importance of language skills (listening, speaking, reading and writing) and highlights that reading skills could be fastened for learners with deficiency when music is integrated. On the one hand, it increases awareness to reading skills of learners; on the other hand, it stimulates their imagination and interest. Usage of music is a kind of critical thinking and questioning strategies for learners not only motivating them to the topic from different perspective towards events but also to have an insight to linguistic patterns they include. Folk song is defined as song originating among the people of a country or any area, passed by oral tradition from even one singer, from one generation to the next generation often existing in several versions, and marked generally by simple, modal melody and stanzaic, narrative verse (http://www.dictionary.com/browse/folk-song). Folk songs are typically about a community of people, and the issues they feel are important to them (https://www.thoughtco.com/what-is-a-folk-song-1322550).



Teaching Turkish as a foreign language (TFL) gains importance since there are several learners coming to Turkish universities to continue their education or foreigners being interested in learning Turkish culture and language because of globalization. This situation requires for Turkish institutions to focus on teaching and revise their programs about how teaching should be realized for foreigners learning TFL. In this respect, the attention directly penetrates into educational principles and specific ways to realize teaching. This is why, approaches, methods and techniques gain importance more than ever. No matter various methods and techniques are used in teaching TFL, because of increasing number of foreign learners and different learning strategies, methods and techniques are needed to be investigated and renewed in order to get high performance among learners. Therefore, methods and techniques are continuously reviewed. Hence, materials used in teaching foreign language change and especially culture-based ones become more important as they not only limit it to words and grammar but also introducing linguistic, socio-cultural patterns in an harmony. This is certainly achieve by poems and different cultural texts (Seckin Polat ve Dilidüzgün, 2015: 815). Poems have been investigated in TFL; however, there are few studies on folk songs even though they are tools directly informing learners within culture (Keskin, 2011: 378). Transferring cultural richness via folk songs in learning process facilitates a foreign language faster and more permanent since they include proverbs, idioms, phrasal verbs and sayings within a melody, which is easier to remember or recall (Cangal, 2012). In addition, they improve listening skills in phonological way such as intonation, tone and accent.

#### Folk Songs in Teaching Turkish as a Foreign Language (TFL)

Folk songs and lullables are probably cornerstones peculiar to each culture since they are signs of universal human features reflected in words including bad and good events such as wars, migrations, catastrophe, birth, enthusiasm, and celebrities (Fidan, 2011; Lomax, 1968). In addition, they are traditional products that develop intimacy since they are important sources transferring cultural changes from region to region within history. Özbek (1981) defines folk songs as reflections of emotions such as love, anger, fear, loneliness, desire, sorrow, passion, and grief, which is likely to realize in daily lives of people. Moreover, folk songs include different depth peculiar to its own style emboldening social habitat and life like emotions, thoughts, and humor (Sentürk and Chordia, 2011: 269). Değirmenci (2006) especially underlines that folksongs composed in Anatolia play a vital role in developing Turkish Folk Music because they reveal self-elements and life experiences in culture via music and language (Jolly, 1975). On the other hand, while folk songs expose learners to target language, they also provide an exploration to that culture, its richness and history in reality (Griffin, 1977); moreover, a lesson based on a song and prepared well can enhance students' indulgence about success, self-confidence, positive attitude to Turkish language and both academic and psychological self-realization (p. 942) at different levels occurring naturally in an entertaining way as they are authentic materials to decrease motivation problems of learners (Nisanci, 2013). In addition, music and lyrics in songs reflect common behaviors, attitudes, and beliefs that facilitate understanding towards that culture, literature, and history (Failoni, 1993: 97). However, considering the short syntactic patterns found in lyrics, it would be fair to state that folk songs are likely be used for B2 level. For instance, Kinik (2011) indicates the lyrics of Turkish folk songs have sincerity even if they are based on jokes and humor so they are very important not only for entertainment but also communication and content on wedding. Therefore, the levels are sensitively taken into account while teaching any target language. In brief, folk songs are the most effective and entertaining tools to learn language and culture, and to create a warm atmosphere in order to remove prejudices (Keskin, 2011). Upon consideration of lyrics based on events or stories, another important issue is their classification necessary to point and one way of classifying Turkish folk songs given by Mustan-Dönmez and Hashas (2014) is to sort them by topic as lyrical, satirical, and narrative ones. However, since the aim of the present study is to investigate Satirical Turkish Folk Songs that are generally used in wedding ceremonies, circumcision feasts and henna nights, they are taken into account as satirical Turkish Folk Songs used in ceremonies are important because they are both entertaining and informative as they are so natural, ordinary topics like humor or entertainment (Tekin, 2012).



## THE STUDY

In order to sort out which methods and techniques Turkish prospective teachers (TPTs) apply for weddingthemed folk songs in teaching TFL; how they utilize language skills/integrated skills; and what activities they prefer in teaching process at B2 level, the research questions are framed as follows:

- **1.** Which methods do Turkish Prospective Teachers apply while teaching TFL through Turkish wedding-themed folk songs?
- **2.** Which techniques do Turkish Prospective Teachers apply while teaching TFL through Turkish wedding-themed folk songs?
- **3.** Which language skills/integrated language skills are preferred by Turkish Prospective Teachers while teaching TFL through Turkish wedding-themed folk songs?
- **4.** Which activities are preferred by Turkish Prospective Teachers while teaching TFL through Turkish wedding-themed folk songs?

In this study, Turkish prospective teachers (TPTs), who take *Teaching Turkish as a Foreign Language II* course (YDI-412) in their fourth grade at the faculty of education in Çukurova University, were given individually the names of the cities (N: 81) in Turkey according to the alphabetical order in their attendance sheet for 3 groups and asked to choose one Turkish Folk Song on wedding concept related to each city they were assigned for preparing lesson plans for two-week-period. The aim was to prevent overlapping of cities and to include all the cities in Turkey for this present study because TPTs come from different regions in Turkey. All assignments were collected by the researcher to do analysis in terms of methods, techniques, language skills, and activities based on wedding-themed folk songs in teaching TFL at B2 level.

This study is limited to only one wedding-themed folk song in each city in Turkey. Regional and thematic differences of folk songs are out of focus.

In this study, Turkish folk songs on wedding concept were chosen randomly and their lyrics were tape scripted by TPTs to focus on wedding concept in order to shed light on this issue. Totally 69 folk songs out of 81 were accepted as they directly contained within wedding concept for valid and reliable analysis. The other reason was that until 1990s the number of the cities in Turkey was about 67 and the following years this number is increased regarding globalization in the world. In this respect, since folk songs dates back old ages as well, it is considered that the number of the folk songs for each city seems reasonable as also presented regarding the years the change happened in Turkish cities in the table below:

<b>.</b>	
Years	Ν
1927	63
1945	63
1960	67
1980	67
1990	73
2000	81
2009	81
2012	81

Table 1 Number of Cities Added According to the Years (TFL)

Resource: TÜİK- General Directorate of Provincial Administration

(http://www.arem.gov.tr/turkiyede-il-ve-ilce-sayilarinda-degisim)

Upon this information, methods, techniques, language skills and activities TPTs applied on wedding while teaching Turkish folk songs in TFL were analyzed and presented in the tables below.



## FINDINGS

In this study, 69 folk songs determined so as to find answers to the research questions which methods TPTs applied while teaching TFL (Table 1); which techniques TPTs applied while teaching TFL (Table 2); what language skills they preferred (Table 3) and what activities they preferred (Table 4) are analyzed and presented in the following tables.

Methods	F	%
Drama	40	23
Presentation	26	15
Practice/Drill	24	14
Discussion	16	9
Audio-Visual	15	9
Explaning Values/Comparing inter/intracultures	11	6
Observation	10	6
Expression	7	4
Immersive	6	3
Inquiry	6	3
Discovery	4	2
Audio-Lingual	2	1
Feedback	2	1
Project-Based	2	1
Teach-Back	2	1
Deductive+İnductive	1	0,5
Eclectic	1	0,5
Total	175	100

Table 2 Methods Applied by TPTs in Teaching Turkish as a Foreign Language (TFL)

As observed in Table 2, most of the TPTs preferred using drama (23%) while teaching Turkish language and the next methods used are presentation (15%) and practice/drill (14%). Discussion and audio-visual methods are given equally importance (9%) the same as in ratio of explaining values and comparison between/among cultures (6%), especially in multi-national classes. Even though discussion and expression methods seem similar to each other, TPTs use expression methods less (4%) than discussion (9%). Immersive and inquirey also take part as used methods (3%) by TPTs while teaching TFL. The analyses about the least used methods appear to be discovery (2%), audio-lingual, feedback, Project-based, teach-back (1%), diductive and inductive and eclectic (0,5%).

Table 3. Techniques Applied by TPTs in Teaching TFL

Techniques	F	%
Brain storming	16	36
Visuals/realia (illustration)	10	23
Presentation	7	16
Question-answer	4	9
Technology	3	7
Concept map	2	5
Mind map	1	2
Total	44	100

Table 3 gives information which techniques TPTs used while teaching TFL. As seen in the results, the most used techniques are brain storming (36%), illustration (23%), and presentation (16%) where as the other techniques are given less attention. For instance, question-answer appears as (9%), technology is (7%), and concept map is (5%). The least utilized technique is mind map (2%).



Language skills	5	Integrated language skills			
	F	%		F	%
Listening	46	31	L*+S*	11	20
Writing	33	22	L+W*	8	15
Speaking	28	19	L+R*	4	7
Reading	22	15	L+W+S	8	15
Vocabulary	31	21	L+R+S	7	13
Grammar	18	12	L+W+R	4	7
			L+W+S+R	13	24
Total	148	100	Total	55	100

Table 4. Language Skills and Integrated Language Skills Used by TPTs in Teaching TFL

L\*-Listening; W\*-Writing; S\*-Speaking; R\*-Reading

As seen in Table 4, the most used language skill (31%) is listening since folk songs are taught much more easily in listening activities. The following skill is writing (22%) as TPTs used listening activities such as filling in the blanks and matching etc. the ratio for vocabulary teaching seems to be 21% when compared to speaking (19%) since in communication it should be the words to convey the messages more functionaly. Upon consideration of the results in the table above, it is observed that reading skills (15%) and grammar (12%) are the least parts when the wedding-themed folk songs are used in teaching TFL process. TPTs also used integrated language skills including two skills in activities such as listening and speaking (20%), listening and writing (15%), listening, reading, and speaking (13%), listening, writing, and reading (7%) whereas TPTs use all the language skills (24%) in teaching the wedding-themed folk songs at the activities.

Table 5	Activities	Used	bv	<b>TPTs</b>	in	Tead	ching	TFL
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Activities	F	%
Fill in the blanks	24	21
Singing the song together aloud	17	15
Write a story	15	13
Matching the words with their meanings	13	11
Finding language patterns	10	9
Following the lyrics aloud individually by lines	6	5
Guessing the meaning of the words/idioms	5	4
Teaching the song within a text/story	4	3
Unscrambling the lyrics	3	3
Write a Dialogue	2	2
Preparing card/poster about the song	2	2
Asking questions	2	2
Teaching vocabulary by technology	2	2
Using context map	2	2
Singing folk song individually	2	2
Memorizing the folk song	2	2
Composing a new folk song	1	1
Make a Video	1	1
True/False	1	1
Completing the statements	1	1
Note taking while listening	1	1
Changing the words in lyrics before listening and	1	1
finding the correct versions during listening		
Matching the idioms with their meanings	1	1
Total	117	100



Table 5 gives information about which activities are applied by TPTs during the teaching process of weddingthemed folk songs. According to the results, activities about filling in the blanks appears as the mostly used one (21%). Later singing the song together aloud (15%) and writing story about the folk song (13%) takes part as the most applied activity. Matching about the words or idioms with their meanings/synonyms (11%) is the other activity preferred by TPTs. Finding linguistic patterns is also observed to be given space in the exercises (9%), that facilitate to learn and communicate. Following the lyrics aloud individually by lines (5%), and guessing the meaning (4%), teaching the song within a text/story (3%) and unscrambling the lyrics (3%) are given almost equally importance by three times in using as activities. The TPTs use the techniques of writing a dialogue, preparing card/poster about the song, asking questions, teaching vocabulary by technology, using context map, singing folk song individually, memorizing the folk song only twice (2%) whereas they used the least ones as composing a new folk song, making a video, preparing true/false, completing the statements, note taking while listening, changing the words in lyrics before listening and finding the correct versions during listening, and the last one as matching the idioms with their meanings (1%).

## CONCLUSIONS

The purpose of this study was to find an answer to four research questions regarding teaching Turkish through the wedding-themed folk songs and the methods, techniques, language skills, and language activities the TPTs applied on wedding concept they used during their teaching process at B2 level.

As for the first question which was related to methods used for the wedding-themed folk songs in Turkish lessons by the TPTs, it was figured that the most frequently used ones were drama, presentation, practice/drill, discussion and audio-visual methods since folk songs include cultural hints such as costumes, traditions, dances, emotions etc. Even though folk songs may draw too much attention of foreign learners, the results indicate that TPTs did not put into various methods (i.e., inquiry, task-based or project-based methods) to motivate learners and surprisingly enough eclectic method seems to be the least used one. Upon consideration to eclectic method, it is the language instructors who underline dramatically to use the most functional parts of different methods and make learning permanent.

Regarding the second question related to techniques used by TPTs, it may be said that brain storming, visuals/realia (illustration), and presentation techniques were given much more importance than the others since folk songs include cultural richness that is hard to comprehend for learners coming from different cultural and educational background. Especially vocabulary teaching through lyrics requires brain storming in addition to use visuals/realia to let learners realize what they refer to. For instance, *kina yakmak* literally means to burn henna; however, it means temporary tattooing based on dyes used since antiquity to dye palm and fingernails during henna ceremony, the eve of wedding. Upon consideration of the results, mind map technique doesnot take a vital role in the techniques the TPTs used during teaching process. Nevertheless, this technique is very important to make a combination of words of the lyrics when the idioms and cliches in the folk songs.

For the third question based on language skills/integrated skills the TPTs preferred while teaching TFL through Turkish wedding-themed folk songs, it was observed that naturally listening skills are of the first priority compared to other skills. This outcome is rather natural since folk dances are utilized during listening process. Writing takes part the second important place to be used in activities since learners show their productive skills either in writing or speaking. Then, speaking and reading are observed as used skills in the activities. The results indicate that TPTs get benefit from all the skills without ignoring any of them. In brief, it would be fair to say, TPTs pay importance to all language skills whether isolated or integrated with one more skill such as speaking, writing, or reading; with two more skills (e.g., writing and speaking; reading and speaking; and writing and reading; with all language skills of listening, speaking, reading, and writing at the highest level, proving TPTs are aware of importance of skills to motivate learners individually.

The results of the last question, regarding activities preferred by TPs while teaching TFL through Turkish folk songs, reveal that TPTs use several and various activities such as filling in the blanks, singing the song aloud, writing a story with impression of the song, matching the words/idioms with their meanings, recognizing linguistic patterns, guessing meanings, unscrambling lines of lyrics, using context map, writing a dialogue, singing folk song individually or memorizing it, composing a new folk song, making a video, note taking while listening, finding the correct version of words changed deliberately etc. These activities are apparently useful and creative while producing a target language.

The results of this study indicate that TPTs have a certain insight about using methods and techniques, and language skills and activities while teaching TFL at B2 level. Even though drama method is used more frequently while teaching wedding-themed folk songs, it is also expected that TPTs also use less popular methods or techniques such as task-based or project-based ones/postcards or posters. Any approach to be used in cultural inputs may develop critical thinking for foreign learners when they are exposed to cultural hints like folk songs. The results of this study prove that TPTs could use a variety of activities balanced in both cultural and linguistic sides since any folk song reflecting cultural richness and syntactical, phonological and morphological patterns in teaching TFL as well as individual differences and strategies of foreign learners while learning target languages. In order to shed light more than for this issue, it is recommended that the words related to wedding concept and stories about it should be investigated to gather all picture hidden within melodies and lyrics.

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# M-Learning and English as an Additional Language: A Successful Experience in Primary Education

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## ABSTRACT

This paper is a report of the findings of a study conducted on some primary schools in Spain. The study focused on the use of mobile devices in the learning of English as an additional language. Smart phones and tablets were used to edit pictures and record films in the English in classrooms. The study's main objective was to foster mlearning in order to promote the learning of English. The findings showed the primary students' positive perception about the use of mobile devices and proved that these resources have highly influenced students' motivation towards the arranged activities. All these factors, have also had an enormous impact on the improvement of students' communicative, technological and artistic competences. Therefore, it could be said that the proposal studied is an innovative and cross-curricular one that combines technology, language and art.

## **INTRODUCTION**

Nowadays, the context for learning additional languages is very complex and teachers have to integrate all the necessary cognitive and emotional elements effectively and successfully, including motivation. For this reason, the introduction of new technologies in the classroom, besides appropriate materials and pedagogies adapted to the students' needs, will help achieve the complex goal of teaching languages nowadays (Levy, 2012).

Bearing in mind that teaching is communicating, it could be said that both share common aspects related to cognitive processes: the use and transmission of information, similar techniques and methods and resources (Martínez-Salanova, 2016). Communication is fundamental to understand information, for this reason, as Alsina, Cañabate y de la Creu (2013) explain, the communicative competence is a key competence to learn at school and it should be considered in any educative proposal. These authors also believe that human communication is nourished mainly by verbal language but also by body language, music and visual elements.

The importance of oral skill teaching throughout history and its evolution is introduced in this paper. This skill became important in the XXth century and it was in the 80s with the Communicative Approaches, that the oral skills element became fundamental. Nowadays, the importance of oracy is recognized everywhere, however, its teaching is extremely complex because affective factors such as motivation or anxiety occur. Generally speaking, most teachers think that, organizing oral activities in the classrooms is quite complicated.

Mobile phones have evolved from technological objects to cultural devices. Society, in general, has appropriated these objects which own many more functions than the communicative one, as López & Gómez (2016) state. These authors, in line with Gardner & Davis (2014) suggest that the birth of mobile devices has meant a social change with multiple implications and changes in every social scope. Education is one of the fields in which the use of mobile devices has represented a revolution. Learning through these devices is known as m-learning. It can be said that m-learning is oriented towards collaborative, flexible, spontaneous and informal learning and is based on problem-solving tasks. These characteristics favour its use in education. Cantillo, Roura y Sánchez, (2012) explained that mobile technology has drawn a new educational context contributing aspects such as connectivity, ubiquity and permanence.

This paper describes the characteristics and findings of the project: Films & Photographs: An M-learning Experience in Primary Education and presents the students' opinions and evaluation of the project. It also introduces a reflection on the inclusion of mobile technologies in education with the aim of improving communication and finally, this paper considers the essential role of school as a mediator and facilitator of the development of students' technological competence in a creative, critical and safe way.



#### THE STUDY

The research developed on this project was carried out with 11 and 12 year old children and aimed to contribute to spread m-learning in the field of additional languages teaching. The project in itself constitutes an innovative, educational m-learning experience with the objective of improving oral communication in English as an additional language. The methodological design combines quantitative and qualitative techniques and tools to collect information and perform the analysis in order to know students' motivation towards learning and students' perception towards the improvement of learning.

The most important objective of the research was to analyze students' perception on their own learning and improvement and their feelings in terms of motivation; knowing the teachers' opinions on the project was very important, too.

The sample of students was made up of 101 students belonging to two different schools. 38.1% were boys and 61.9% were girls. Their four teachers also took part in the research. The tools used were questionnaires for the students and interviews for the teachers.

The students' questionnaires were on-line and carried out in the computer classroom where the students could answer freely. The school heads and the families were made aware of the confidentiality notice and anonymity of the data obtained and how this data could be disseminated in the research framework. The teachers' opinions were gathered through interviews.

In order to analyze the data two different tools were used. The quantitative data was analyzed through the statistics program 21 version and the qualitative data was analyzed through descriptive techniques.

## FINDINGS

Students' opinions. The findings related to the communicative competence in English as an additional language showed that most of the students found m-learning helped them to improve their oral communication and comprehension. Students also considered the project's activities, recording and editing videos with smart phones and tablets to be the most effective and motivating tasks.

In terms of technological competence, the data showed that students had known and started to use new apps during the project, "Viva Video" being their favourite app.

Regarding motivation, the results obtained revealed that the use of mobile devices in the English classroom was entertaining and fun for the students and for this reason, their use was considered motivating.

Teachers' opinions. The findings regarding the teachers' opinions were related to communicative competence, technological competence, artistic competence, motivation and teachers' cooperation. Teachers thought that the project's activities had enhanced students' communicative competence in English as an additional language. "Video recording has been a fun activity for the children who have made a great effort to improve their pronunciation." T1.

"The students have involved themselves in the tasks. For this reason, they have been watching videos in English to decide what they wanted to do, improve their comprehension and their oral production when recording the video". T3

Regarding the technological competence, all the teachers agreed with the idea that m-learning provided many advantages because students were used to them and they knew how these devices worked perfectly. Thanks to mobile devices, access to resources and information is very quick and tasks turned out to be suitable

and possible. Immediacy is another characteristic of these devices which are able to record audio, video etc. However, some of the teachers involved in the research, thought that m-learning also presented technological compatibility problems or internet access failures.

T4 thought that the use of m-learning devices at school could lead to serious problems if the devices were used improperly. For example, when students recorded and distributed images at school which were private and should not be shown without permission.

With this in mind, T1 considered that the first thing that teachers should do is warn students about the problems that inappropriate use of mobile technology could produce. Students should be well informed and a contract with them about the use of the mobile devices should be signed. With a contract, students implicate themselves to the proper use of mobile phones and tablets. Generally speaking, the teachers interviewed thought that this experience had been a good opportunity for them and for the students to deepen their knowledge in the ICT.

In terms of artistic competence, T4 thought that the activities within the project had helped to develop the students' artistic skills. The final projects were presented in the classroom and students felt very proud of showing their photographs and films to their classmates and teachers. For this reason, they made a big effort to design them artistically. T1 considered that these activities developed students' creativity and imagination, promoting their artistic competence at the same time. Students designed their productions, including the settings and the plots. Finally, they chose the best mobile app to record and edit their works.

Regarding teacher cooperation, all the teachers agreed that the experience had provided an excellent opportunity to cooperate and exchange opinions, facilitating a fluent and effective communication flow among them. From a teacher training point of view, T3 explained that he did not have previous m-learning knowledge before starting the project but affirmed that mastering new technologies was fundamental for his training. T4 shared the same opinion as T3.

Motivation was another criteria analysed throughout the teachers' interviews. They all agreed that the project design and implementation had been very motivating for the teachers. T2 said that the project had allowed him to experiment with a new resource and besides, the teachers thought that the students had also felt very motivated.

## DISCUSSION

The project: Films & Photographs: An M-learning Experience in Primary Education obtained excellent results because all the people involved valued positively the communicative linguistic learnings and the technological learnings (use of mobile devices and apps).

It also allowed the artistic techniques integration with photography and video production using mobile devices. Students produced a lot of photographs and videos that were shown in the classroom

The edited photographs with different mobile applications were used as a resource to develop oral activities: description, narration, expression of likes and dislikes and feelings. In order to record the videos, the students had to carry out previous linguistic activities such as writing the scripts with dialogues or descriptive texts. Although performing these linguistic activities in a second language can be difficult for the students, they made a great effort to finish them successfully. Another important aspect that should be born in mind is artistic freedom - they had to design and develop their artistic tasks. The use of these resources and the project characteristics had a positive influence on students and teachers' motivation, which is of great importance in the teaching and learning process.

The importance of the intercultural competence which is always linked to additional language teaching should not be forgotten and in this case, was facilitated by the access to mobile resources and freedom of topics.

Cooperation has been another important aspect developed in the project. On the one hand, teachers' cooperative work has been remarkable and teachers' involvement has been very high. They all thought the project was very satisfying and motivating. On the other hand, teachers thought that students had improved their problem-solving capacities, the acceptance of different opinions and making decisions. From the students' point of view, the project was a rich and rewarding experience which helped them to work collaboratively. The methodology used in the project responded to an Action-Oriented Approach that used Project-Based Learning as a teaching and learning tool.

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A similar project was carried out at the Teacher Training and Education Faculty in the University of Oviedo, Spain. The results obtained coincided with the primary project results, presented here.

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# On the Effective Teaching in Vocational School

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## ABSTRACT

Classroom instruction is accepted as a central component the evolution of teachers' guiding - teaching, and the organization of students' thinking - learning. In this paper, we suggest four important factors that could contribute to an effective and learning and teaching environment; 1-teacher background and experience, 2-lecture activities in classroom or in laboratory, 3-assessment or homework activities, 4-effective interaction between the teacher and the students for effective education. The effective teacher is as a maestro that able to orchestrate the music of the classroom. Finally, we can say that when the teacher becomes more involved in the learning process, the effective result of the teaching will become efficient.

Key words: effective teaching, vocational school, important factor

## INTRODUCTION

Traditionally, teachers were the 'holders of information' and their role was to transference this knowledge to students. The internet has changed all that as information can now be obtained anywhere, any time on any subject. Thus the role of teachers has changed to developing the skills and tools to assist students in analyzing the information available (Slavin, 2010.)

Effective teaching is more than just the professional transference of knowledge and skill on a mathematical subject. Effective teaching provides that this weak approach to learning is replaced by powerful, student approaches to learning that analyze, develop and create understanding. Students need to initiate learning and maintain engagement during learning in their development as mathematics learners (Teddlie, Stringfield, & Burdett, 2003).

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The answer of Smith (1995) is that learning is a consequence of experience for the question of 'what is good or effective teaching?' He proposed teaching and learning should be focused on the creation of appropriately wellorganized experiences so that learning comes naturally. He stressed that schools should focus less on 'talking about learning and teaching' and 'more about *doing*'. For the effective teaching, we need to reflect on what we do in the classroom rather than on the talk about theoretical way of the lecture. So, it is clear to say that to reach an effective teachers we need to identify clearly what it is that effective teachers do in all educational activities.

Alton-Lee (2003) has provided ten point model for the characteristics of quality teaching which cover the following areas:

- A focus on student achievement.
- Pedagogical practices that create caring, inclusive and cohesive Learning communities.
- Effective links between school and the cultural context of the school.
- Quality teaching is responsive to student learning processes.
- Learning opportunities are effective and sufficient.
- Multiple tasks and contexts support learning cycles.
- Curriculum goals are effectively aligned.
- Pedagogy scaffolds feedback on students' task engagement.
- Pedagogy promotes learning orientations, student self-regulation, metacognitive strategies and thoughtful student discourse.
- Teachers and students engage constructively in goal oriented assessment. (Alton-Lee, 2003)

According to Gurney (2007), these ten models lead to the two extremes of the quest that 'focus on what you do' and 'a deep analysis of the best evidence on quality teaching'. In reaching his own conclusions he had found a path that draws these two philosophical approaches together so that he reached a possible new model that will provide further direction in the quest for that 'good teacher'. Then, he suggests that it is the interaction of the following five key factors that provide a basic for a good teaching:

- > Teacher knowledge, enthusiasm and responsibility for learning.
- Classroom activities that encourage learning.
- Assessment activities that encourage learning through experience.
- > Effective feedback that establishes the learning processes in the classroom.
- Effective interaction between the teacher and the students, creating an environment that respects, encourages and stimulates learning through experience.
  - (Gurney, 2007)

In this study, we explain that we understand some of Gurney's five key factors for good teaching.

## TEACHER BACKGROUND AND EXPERIENCE

In his search on the question 'how children fail?, Holt (1964) reached that schools did not recognize the living quality of education. He stressed that the boring nature of tasks, the dishonesty of teachers with the limiting of knowledge. This expression was the leading point of Gurney's teaching model that the creation of a classroom that reflects the teacher's knowledge, enthusiasm and the responsibility for creating a learning environment that will effectively enhance the student's desire to learn. Gurney stressed that to create this environment, the teacher must be prepared to all dimensions of an education system that reflects a conservative way of schools. Teachers need to develop their thinking about the nature of teaching and learning.

Many theories about reflective practice provide special direction for critical self-reflection (Bailey, Dale, and Squire, 1992; Baird, 1991; Cole and Knowles, 2000; Day, 1999; McMahon, 1999 & Stodolsky, 1990).

According to Baird (1991), 'teaching is more than a craft', suggesting it is an 'educational science and a pedagogical art'. Cole and Knowles (2000) stressed a model for reflective best approach that includes the following key words: 'Learning, Participation, Collaboration, Co-operation, and Activism'.
We believe that the SCORE model suggested Strong, silver and Robinson (1995) should be applied to teachers to reach the aimed education model;

- S: The Success of mastery of the subject that you teach.
- C: The Curiosity that every teacher should have entrenched in their teaching. A teacher who is not curious has lost a critical portion of the passion for learning.
- ✤ O: Originality a teacher who is passionate about the teaching process will be creative; will be constantly seeking new ways of engaging and challenging students.
- *R*: Relationships are central to the effective classroom and teachers are crucial in the nurturing of opportunities for students to engage with subjects that at senior levels can lead to a life-long interaction with the subject.
- *E:* To maintain this process the teacher needs Energy. This a something that schools do not always provide, and teachers in general need the time to reflect; to re-energize and to regenerate their focus on the learning process. It is an essential ingredient in the effective classroom that is too often ignored. (Strong, silver and Robinson, 1995)

#### LECTURE ACTIVITIES IN CLASSROOM OR IN LABORATORY

Smith (1995) gives the answers the question presented in this study as to what do effective teachers do in the classroom. It is a well-known realty that an effective classrooms and a modern laboratory is the one of the basic key factor that supports an effective learning environment.

Stipek (1996) presents six efficient methods that support the idea that 'an effective classroom is a classroom of opportunity and experience, where learners can explore and experiment in a climate that recognizes the process of learning as the measure of success rather than the right answer approach'. He also expressed that 'the vital role of intrinsic motivation in creating an environment where students can feel that they are the masters of their own learning'. In other words, 'quality teaching provides sufficient and effective opportunity to learn'.

The fact that a teacher may be successful in one semester does not necessarily mean that the success will be continued in the next semester (Strong, silver and Robinson, 1995). The teaching environment may be the same but the attitudes that each different students' group moved a classroom will always influence the outcome of the education. Instructors should be able to identify the different ways of each class and work with their students to create best learning environment targeted.

#### ASSESSMENT OR HOMEWORK ACTIVITIES

the assessment could be a part of an effective education system. the nature of an educational environment that is dominated by assessment procedures could have some difficulties for the learning environment. Gurney expressed that 'if the students are able to see the value of the learning process, and the assessment is a part of the learning and not an end in itself, then they can buy into the process and actually use it to gain better results while benefiting from the learning environment which they help to generate through their self-monitoring and peerassessment activities'.

Cameron (2002) demonstrated the classification of assessment that are identifying the processes of peer tutoring, co-operative learning, reciprocal teaching through predicting answers, questioning, clarifying and summarizing and collaborative reasoning. All of Cameron's processes when used in an educational environment will develop the students as they are main actors playing for the learning. So, the coherent answer to the Smith's question mentioned above is turning on that If assessment activities are part of the 'doing' then they become a central part of the learning process.

#### EFFECTIVE INTERACTION BETWEEN THE TEACHER AND THE STUDENTS

Hattie (1999) claims that 'feedback – focused, appropriate, timely and learning related should be one the main educational character of the effective teacher'. He defines feedback as 'the most powerful single moderator that enhances achievement'. As instructors, we applied this definition with modifying a classroom where our feedback to the learners was aimed at encouraging them to become more active learners. In this application, our explanations, our questioning methods and our assessments linked with the learning environment interplaying of

feedback and students' input. We observed that our students gave feedback as they know that their own learning would become part of the feedback process.

Slavin (2010) noticed that 'the value of feedback but warns that too much can be as detrimental as too little' and 'the nature of interplay of learning and teaching in the activities of the effective classroom adds to the value of the feedback in such an environment'. According to Gurney (2007), Slavin's approach provides another key aspect of the effective teacher: 'feedback that is appropriate and meaningful to the learner will be a central part of the effective learning environment'.

## RESULTS

Eisner (2002) explains the meaning of the very nature of the effective classroom by his famous words that 'every generalization we make, every conclusion we draw, must be true of every individual'. The effective teacher will be able to organize the administration of the classroom, into an environment of excitement for learning. The point about the effective teaching process is that it is continuously skiing that is important and done balanced. As Gurney (2007) noticed that 'the teacher becomes more involved in the learning process, as the passion for knowledge is shared with the students, so the effective nature of that teaching and learning environment will become evident'. Finally, and shortly, we can say that when the teacher becomes more involved in the learning process, the effective result of the teaching will become efficient.

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# **Online Assessment for Mathematics Lecture**

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#### ABSTRACT

The use of computers as a main material of education to teaching and learning mathematics is a method that teachers reorganize their lecture presentation and educational activities and laboratory applications. An online assessment or e-assessment is used to take in parts of an assessment system. Questionnaires and online tests can be presented and completed outside of educational environment or in some controlled areas.

In this respect, the use of online assessment has a number of advantages for both the teachers and the students. In this study, we make some analyzing on the use of an online assessment tool that ALICE Interactive Mathematics (AIM) provides interactive feedback to students learning mathematics. The results say that the technological assessment tool can be offered because of improved pass rate and students' satisfaction. **Key words**: online assessment, computer environment, flexible learning opportunities

# INTRODUCTION

Assessment can be a tool for accountability, but it can also be a process for students' learning. It is well known and accepted reality for assessment that teaching involves the efficient use of both formative and summative assessment. Additionally, the online assessment areas presents some unique alternative for assessment, but also offers some special applications for positive assessment.

When the using of computers to teaching and learning be widely in education, many teachers have to reorganize their teaching strategies for all educational activities in the all level of the schools. However, it is not a scientific true that the use of computer-assisted learning only provides significant effect to students and teachers. Lawson (1995) stressed that the introduction of students to a computer software program perceived as a non-significant activity.

In his study, most students think the using of computer software package as interesting, because of its nonsignificant way, they tend to change for the more traditional mode of educational environment. Maybe it can be one reason for the changing that the assessment is a traditional nature, being based on written tests and examinations by face to face application.

Herrero stayed that "Instead of simply giving examples of objects that satisfy a definition, or checking that they satisfy a certain list of properties, students are led through a series of exercises to work with the examples and explore their properties". This mean that Leaving students to work on the computer without any additional activity is not a useful strategy, but positive effects can be expected when the computer programs is supported to the assessment process and other educational activities. The use of computer technology as a tool for learning and teaching should be good planned and computer projects need be special planned for every students' expectation from the lecture.

In this study, we analyze the effect of a computer tool containing a mathematical software focusing on algebraic expression to use online assessment. The assessment project used for this paper is about the self-assessment in an elementary mathematics subject. The availability of an internet page accessed from anywhere with an internet connection provide students different alternatives and advantages in the learning process. It is important part of education process that assessment tools giving feedback at appropriate points of the learning and teaching process provide the expectations of teachers and learners that provide. Additionally, the online assessment tools should be organized for the different presentation of questions that the teacher and students see valuable in their teaching and learning.

#### THE ASSESSMENT PROCCESS

A useful feature of studies of assessment in last years has been the change of the point of attention as more interest in the interaction between online assessment and learning. This new situation could provide that improvement in online assessment will give a strong contribution to the improvement of teaching and learning (Claxton, 1995).

Students' demand is grooving up for more feedback to problems given out in classrooms (Cizek, Fitzgerald & Rachor, 2005). This has led to the confirmation of a lot of material in the computer downloads. We modified this situation by the presentation of the questions, which are automatically assessed by the package Maple. The questions were grouped for students to test the various topics.

The diversity of student backgrounds and learning styles is continuously increasing when the computer technology come in the education life (Daro, 1996). Some students can concentrate continuously for several hours trying to learn a particular concept. For many students, it is more useful to be able to do themselves with the tasks. Students access to learning material on the internet couldn't be enough to accomplish to lecture. Many students getting lecture material from the internet tend to make homework later, if the assessment is independent of internet usage. For the positive contribution to students' learning, they need to interact with the lecture material. Students' learning mathematics have a special meaning that the understanding of how a solution method reached to the result. So, we need to find feedback to the students that a correct answer will give a position to operate the other part correctly.

#### THE SOFTWARE FOR THE LECTURE

There are various views of the category of mathematical software which used for them (Fairbrother, Black & Gill, 2004). Maple is used by ALICE (Active Learning in a Computer Environment) Interactive Mathematics (AIM) to assess solutions submitted by students that are provided via the International Workshop on Advanced Learning Technologies (IWALT, 2000). In this study, AIM is used as a supported tool to manage the projects. AIM allows students to provide immediate feedback and detailed solutions.

The internet web pages use the randomization facility within Maple. This mean that we have the two levels of randomness in the organizing of questions. These are the randomization of variables, algebraic expressions – equations for a task, and the randomization of a set of questions.



Also, images of mathematical subjects can be used for questions (Fuchs, 1993). Feedback can be provided to students in a variety of forms, at any times and anywhere. It can be said that the development of quality questions and feedback take time, but, teachers has the chance of the reduced time spent on assessment.

#### **ORGANIZATION OF THE PROJECT**

Ten practice question files, covering all topics in elementary mathematics, were added in the organization of the project. In every question, practicing of students' skills in problem solving was aimed. The multiple response questions and questions that contain full solutions are available to the students. Eight sort test quizzes were applied in this projected, beginning at the third week of the semester. The solutions are closed to the students until after the deadline of the exams.

The student would take 1 point for a correct answer and 0 point for a wrong answer for grading of every simple question. A penalty can be used for students' more. It is possible for teachers to change the grade groups. The instructor can give award points based on the solution given from the students via a configuration in the software.

The assignment of penalties and multiple attempts does not contribute to the learning outcome and this feature can be get out for the practice questions. However, in a test exam, it provides the instructor a means for classification of the students. The student participated in all working was possible to give additional marks, instead of giving 0 for the special question. It depends the teachers' decision that special mark is equivalent to the mark the student would have taken when an incorrect solution is done (Sew, 2003).

#### ASSESSMENT OF THE PROJECT

The use of the Internet for assessment and the experience may be the first time for the study group students. The system requires students to understand the basic syntax for writing algebraic expressions for a computer program. It is not necessary for the students to be well at using computer program and to know the software.

Students do not need to know the use of the functions of the program, which are found on many mathematical software and most graphics calculators. In addition, students need to know some simple operations as that calculating of numbers operations, taking the square roots of an expression, entering a matrix, a vector and a function.

As an interactive assessment tool on the web the use of Maple brings with the possibility of different learning modules. Although, many pure mathematics and mathematics education researchers think that the use of mathematical software package, and although they find the package useful for manipulating of some algebraic expressions or matrices having big dimensions, they tend to make little use of computer programs. Our study group students were aware of that the software was used as the assessment material of the mathematics in this current project.

The study group students understood that they have benefited from this learning experience. This can only be corrected by their feedback and performance. The evaluation of whether the tool resulted an expected learning rate for students has the same way. The students' perception about the usefulness of the internet tool to their learning was evaluated from an exploration, which was completed by 26 students.

The search was conducted in week 9 of a 14-week semester, and by that time, 22 students responded that they were more comfortable with internet testing than at the beginning of the semester. Four students had some problems with internet testing and only two students did not have any idea about internet testing. The following questions (Sew, 2003) were asked, and the student responses are given beside each question whether the system helped them with their learning



#### (Table 1).

Questions	Yes	No	Unsure
Does the availability of web question files help your understanding of	20	4	2
topics in mathematics?			
Do you find the feedback on the web questions useful in learning?	23	2	1

**Table 1**: The student responses to the questions about internet assessment.

#### RESULTS

The project with the following preferred outcomes is evaluated that an enhanced student-learning rate, flexible learning opportunities, and automatic assessment (Sew, 2003).

Percentage of students scoring											
Year	Less than 50%	50–69	70–79	80% or more							
2014	20	40	30	10							
2015	22	66	10	2							
2016	4	52	26	18							

**Table 2:** Percentage of students scoring from the assessment

The management of the quiz tests consists of copying the grading statistics from the internet web page at the end of each quiz test. Flexible learning opportunities are attained with the internet tool from the points of view of students and the teachers' point of view. First, the majority of students attained very good marks for each of the first six tests. This is because the students were told that the best of six out of the eight tests would count towards the final assessment. 20% of the assessment comes from a handwritten assignment, half of which contains questions on proofs and the other half requires the use of Maple. To pass the lecture, students must obtain at least 30% of the marks from the end-of-semester written examination and a combined total of 60% of the total assessment (Table 2).

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# **Organizational Commitment of Secondary School Teachers**

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#### ABSTRACT

This study aims to determine the organizational commitment of secondary school teachers to their schools, colleagues, the teaching profession and instructional work. The population of this descriptive survey consisted of 1,602 teachers who were working at 55 secondary schools located in Elazığ city center during the 2016-2017 school year. The data collection tool was distributed to 460 teachers working at 11 randomly selected schools. However, data from 349 teachers were analyzed. The data collection tool consisted of two sections. The first section included conceptual questions, and the second section included items about teachers' organizational commitment behaviors. The results showed that teachers were "always" committed to an advanced sense of duty, and "often" committed to colleagues, the teaching profession, school development and the entire scale. Male teachers were more committed to the teaching profession. They stated more than their female counterparts that they would choose the profession even if they did not have to work, that they were proud of the profession, they saw it as an ideal profession, that they wanted to have recognition, and that they viewed choosing the profession as the most positive decision in their lives.

Keywords: Secondary school, organizational commitment, commitment to the teaching profession

#### INTRODUCTION

The degree to which a task is effectively carried out depends on the quality of the work environment. The concept of work environment is also known as organizational effectiveness, environment, climate, organizational ideology, ecological field or organizational information (Hoy, Tarter, Kottkamp, 1991; Celep, 2000:143). The sense of work environment that teachers have may affect their styles of work. One of the factors that form the bases of teachers' sense of work environment are their interest and attitudes towards the objects in their work environment (profession, work, team, student, school). One concept that encompasses the interest of workers in the objects in their work environment is organizational commitment.

As a concept and way of understanding, organizational commitment exists anywhere with a sense of community and is an emotional representation of social instincts. Embodying the loyalty of a slave to his master, of a civil servant to his duty and of a soldier to his homeland, commitment was once referred to as loyalty and refers to the state of being loyal. Overall, commitment is an ultimate feeling. Feeling committed to a person, a thought, an institution or something bigger than ourselves refers to a responsibility which we must meet (Ergun, 1975).

Organizational commitment is a biased and effective commitment to organizational goals and values. More than a mere tool, this type of commitment requires an individual to play his role solely for the well-being of the organization, in relation with its goals and values (Lodahl and Kejner, 1965; Artun, 2008).Committed workers firmly believe in the goals and values of the organization, voluntarily follow orders and expectations (Firestone and Pennell, 1943; cited in Balay, 2000). Being a work-related attitude of workers, organizational commitment is defined by Mowday et al. as "a high level of belief in and acceptance of organizational goals and values, the will to make a real effort for organizational goals; and a strong desire to stay in an organization and continue membership in it" (Mowday et al., 1979; cited in Boylu, Pelit and Güçer, 2007). Commitment is defined as "behaviors limited to one's actions or those that exceed formal, normative expectations" (Mowday, Steers, Porter, 1979; Celep, 2000:15). First coined by Lodahl and Kejner (1965), Mowday et al. (1979) define organizational commitment as an individual identifying with a certain organization and the strength of his ties to it. Kanungo (1982) treats organizational commitment in two dimensions, commitment to work itself and to the organization, and defines the term as the psychological association that an individual has established with an organization.

Allen and Mayer (1991) developed a three-dimensional model by emphasizing the psychological side of organizational commitment. They explored organizational commitment in three levels: affective, continuance and normative commitment. Affective commitment is defined as the wish of workers to commit emotionally to the organization. Workers stay in the organization with their own will and desire. Continuance commitment refers to the workers to make the decision of staying in the organization by weighing the costs of leaving against the benefits of staying in the organization.



Normative commitment, the final dimension, refers to a type of compulsory commitment in which workers stay in the organization owing to a sense of security and responsibility (Erdil and Keskin, 2003). Commitment to the school is defined as teachers adopting the goals and values of the school, making an effort to meet them, and sustaining their will to stay in the school. This definition is based on "organizational commitment" (Mowday, Porter, Steers, 1979, p.232; Celep, 1998:58).

#### **Teachers' Organizational Commitment**

Teachers' organizational commitment is divided into the subheadings commitment to school development, commitment to colleagues, commitment to the teaching profession and commitment to an advanced sense of duty.

#### **Commitment to School Development**

Teachers' commitment to school development was tested with the items "I am proud of my school, my school gives me the passion to work, I enjoy working at my school although I could work elsewhere, I feel that my school is the best, I care about the future of the school, I make more of an effort than is expected for the school, I actively attend the meetings at the school, and I would willingly teach a course outside my subject area to stay in the school."

#### Commitment to an Advanced Sense of Duty

This dimension was tested with the items "I make a lot of effort for unsuccessful students, I do my best at my job, I make time for my students outside the classroom for both course-related and other issues, I go to class on time, I enjoy going to class".

#### **Commitment to the teaching profession**

Teachers' professional commitment was tested with the items "I would continue the teaching profession even if I didn't need the money, I am proud of being in the teaching profession, I view the teaching profession as an ideal profession, I would like to have a name in the teaching profession, choosing the teaching profession was the best decision in my life".

#### **Commitment to Colleagues**

Harmony between colleagues and close and friendly relations create a motivating environment for work success. When this relation is directed towards the goal of the organization, it may increase the efficiency of the organization. Teachers' commitment to colleagues was tested with the items "I am proud of my colleagues, I believe other teachers see me as a close friend, my best friends are other teachers in the school, I enjoy being with other teachers between classes, I see myself as a close friend to other teachers, I maintain a close relationship with other teachers outside the school, I avoid creating problems for colleagues, I am willing to help my colleagues solve work-related problems".

#### THE STUDY

#### Purpose

The aim of this study is to determine secondary school teachers' commitment to school development, colleagues, the teaching profession and an advanced sense of duty.

Answers to the following questions were sought in the study:

1. What are secondary school teachers' organizational commitment feelings in the subdimensions and the entire scale?

2. Do secondary school teachers' commitment to the development of their school, their colleagues, the teaching profession and an advanced sense of duty vary depending on variables such as gender, marital status, age, professional experience, title, subject area, work place and place of duty?

3. Is there a significant relationship between the subdimensipons of the organizational commitment scale and secondary school teachers' gender, marital status, age, professional experience, title, subject area, work place and place of duty?

#### METHOD

This study is a survey. Surveys aim to describe a past or present situation, event, individual or object as it is, in its own conditions (Karasar, 2009:77). The population included a total of 1,602 teachers working at 55 secondary schools located in Elazığ city center during the 2016-2017 school year. The data collection tool was distributed to 460 teachers working at 11 randomly selected schools. However, data from only 349 teachers were ultimately analyzed. The data collection tool had two sections. The first section comprised conceptual questions and the second one comprised items about teachers' organizational commitment behaviors. Sample size was determined by using the table designed by Krejcie and Morgan (1970). Accordingly, the sample size necessary for 95% confidence level in a population of 1,600 individuals was 310 (Krejcie and Morgan, 19709:607).



The measurement tool used in the study, teachers' organizational commitment in educational institutions scale, was previously used by Celep (1998). It had two sections for teachers and students. The first section comprised conceptual questions aiming to describe teachers' demographics, while the second section included 32 items aiming to determine teachers' organizational commitment feelings. The data collection tool was graded as "Always (5), Often (4), Sometimes (3), Rarely (4), Almost never (1)". The interval of the tool was 4/5= .80. The yapı validity of the tool was measured with exploratory factor analysis. Factor analysis is a statistical technique aiming to gather the variables measuring the same construct or quality and describe it with a few factors (Büyüköztürk, 2009:123). The suitability of the data for factor analysis was tested with Kaiser-Meyer-Olkin (KMO) and Barlett's tests. Bartlett Test = 5657,749 and validity coefficient KMO =.918, p=.000. The minimum recommended KMO value for factor analysis to be performed on data was 0.60 (Pullant, 2001). Therefore, the data were deemed suitable for factor analysis. As a result of the first exploratory factor analysis on Teachers' Organizational Commitment Scale, four items with factor load values below 0.40 (items 3, 23, 27 and 31) and another item which appeared in more than one factor with a difference of .10 between them (item 19) (Büyüköztürk, 2009:125) were removed from the scale. At the end of the second factor analysis, another item that appeared in multiple factors and had a difference below .10 (item 22) was also excluded. Ultimately the number of items in the scale went from 32 to 26. The scale had four factors. The total variance explained by the four factors was 60%. Following factor rotation, the first factor of the scale had five items (12, 16, 20, 25, 26) and its Cronbach Alpha reliability value was .80. The load values of items in the first factor varied between 0.493-0.782. Factor two had eight items (8, 9, 11, 14, 17, 21, 30, 32) and its Cronbach Alpha reliability value was .84. The load values of items in factor two ranged between 0.655-0.730. Factor three included five items (4, 5, 10, 18, 24). The Cronbach Alpha reliability value of this dimension was .80. The load values of items in factor three varied between 0.767-0.833. The fourth factor had eight items (1, 2, 6, 7, 13, 15, 28, 29). The Cronbach Alpha reliability value of this dimension was .83. The load values of items in the fourth factor ranged between 0.687-0.790. Factor five consisted of three items (23, 27, 31). The Cronbach Alpha reliability value of this dimension was .68. The factors were named by considering the contents of the items. The first factor was named "commitment to an advanced sense of duty", the second factor "commitment to colleagues", the third one "commitment to the teaching profession" and the final one "commitment to school development".

The data were analyzed on the SPSS for Windows 21 package. Teachers' demographic characteristics (gender, marital status, age, professional experience, title, subject area, work place and place of duty) were identified through frequencies and percentages. The levels of teachers' feelings were identified with arithmetic means and standard deviations. Independent groups t-Test was performed to investigate whether a significant difference existed between the views of respondents with different gender, marital status, subject area and work place variables. In addition, one way analysis of variance (ANOVA) was used to explore whether the feeling mean scores of the groups varied with age, title and years in the profession. The significance level of the tests was .05.

#### FINDINGS

This section presents teacher distribution according to their demographics, findings in the subdimensions based on teachers' feelings, and comments. The demographics of the participating teachers were as follows: 46,7% were female (n=163), 53,3% were male (n=186); 66,2% were married (n=231), 33,8% were single (n=118); 43,6% were aged between 21-30 years (n=152), 35,8% were aged between 31-40 years (n=125), 16,6% were aged between 41-50 years (n=58), 4,0% were aged 51 and above (n=14); 21,5% had 1-2 years of work experience (n=76), 10,3% had 13-17 years of work experience (n=36) and 9,7% had 18-22 years of experience (n=34); 16,9% were teacher candidates (n=59), 76,2 were teachers (n=266) and 6,9% were (n=24) expert teachers; 36,7% were teaching science (n=128) and 63,3% were teaching (n=221) social sciences; 61,3% were working in city centers (n=214) and 38,7% were working in small towns (n=135).

# **1.** Table 1 displays the results of the analyses regarding the question "What are secondary school teachers' organizational commitment feelings in the subdimensions and the entire scale?"

Table 1. Ana	alysis results o	f the Teachers	'Organizational	Commitment	Scale and its	subdimensions
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Subdimensions	X	SS
1. Commitment to an advanced sense of duty	4,30	,62
2. Commitment to colleagues	4,03	,64
3. Commitment to the teaching profession	4,09	,80
4. Commitment to school development	3,93	,71
5. All of them	4,03	,53

As shown in Table 1, teachers evaluated themselves as "always" *commited to an advanced sense of duty*, while they evaluated themselves as "often" committed in other subdimensions and the entire scale.

2. Table 2 displays the results of the analyses regarding the question "Do secondary school teachers' commitment to the development of their school, their colleagues, the teaching profession and an advanced sense of duty vary depending on gender, marital status, subject area and work place?"

Table 2. T-test results of teachers' commitment subdimensions with respect to gender, marital status, subject

area and work place								
Dumonouou	Variables	N	_	66	Levene		4	
Dimensions	variables	IN	Х	22	F	р	— ι	р
1. Commitment to	Famele	163	4,34	,46	7,033	,008		
advanced task	Mala	186	4,26	.73	-		1,241	,216
consciousness	Male		,	,				
2. Commitment to	Famele	163	4,07	,55	3,982	,047	036	350
colleagues	Male	186	4,00	,72			,950	,550
3. Commitment to teaching	Famele	163	4,21	,67	13,829	,000	2 726	007
profession	Male	186	3,98	,89	_		2,720	,007
4. Commitment to the	Famele	163	3,86	,68	1,474	,226	-	116
development of the school	Male	186	3,98	,74	_		1,574	,110
5. All	Famele	163	4,07	,41	13,865	,000	1 1 2 0	250
	Male	186	4,00	,61	-		1,130	,259
1. Commitment to	Married	231	4,27	,67	2,948	,087	-	
advanced task	Single	118	4,35	,51	-		1,035	,302
consciousness	0		<i>.</i>	·				
2. Commitment to	Married	231	4,05	,68	,749	,387	,650	516
colleagues	Single	118	4,00	,57				,510
3. Commitment to teaching	Married	231	4,04	,84	3,987	,047	-	079
profession	Single	118	4,19	,71			1,766	,017
4. Commitment to the	Married	231	3,99	,69	3,316	,069	2,154	032
development of the school	Single	118	3,81	,75				,052
5. All	Married	231	4,04	,55	1,142	,286	,221	,825
	Single	118	4,03	,48				
1. Commitment to	Science.	128	4,27	,63	,223	,637	-,668	,504
advanced task	Social Sciences	221	4,32	,61				
consciousness								
2. Commitment to	Science.	128	3,97	,67	,316	,575	-1,300	,194
colleagues	Social Sciences	221	4,07	,63				
3. Commitment to teaching	Science.	128	4,05	,83	1,316	,252	-,716	,462
profession	Social Sciences	221	4,11	,79				
4. Commitment to the	Science.	128	3,88	,75	1,887	,170	-,969	,333



development of the school	Social Sciences	221	3,95	,69				
5. All	Science.	128	3,99	,53	,064	,801	-1,276	,203
	Social Sciences	221	4,06	,53	_			
1. Commitment to	Province center	214	4,27	,70	5,442	,020	-1,151	,251
advanced task	District center	135	4,34	,45	_			
consciousness								
2. Commitment to	Province center	214	4,03	,71	6,200	,013	,061	,952
colleagues	District center	135	4,03	,53				
3. Commitment to teaching	Province center	214	4,03	,84	3,052	,082	-1,658	,098
profession	District center	135	4,18	,73	_			
4. Commitment to the	Province center	214	3,97	,73	,261	,610	1,464	,144
development of the school	District center	135	3,86	,67	_			
5. All	Province center	214	4,03	,59	4,484	,035	-,382	,703
	District center	135	4,05	,42	_			

As shown in Table 2, teachers' *commitment to the teaching profession* varied significantly based on gender (t (347)=2,726, p<.059. Female teachers' commitment to the teaching profession  $(\stackrel{x}{X}=4,21)$  was more positive than that of male teachers ( $\stackrel{x}{X}=3,98$ ). *Commitment to school development* also varied based on gender (t (347)=2,154, p<.05). Married teachers' commitment to school development ( $\stackrel{x}{X}=3,99$ ) was more positive than that of single teachers ( $\stackrel{x}{X}=3,81$ ).

# **3.** Table 3 displays the results of the analyses regarding the question "Do secondary school teachers' commitment to the development of their school, their colleagues, the teaching profession and an advanced sense of duty vary depending on teacher age, professional experience and title?"

Dimensions	Year	N	$\frac{-}{x}$	Source of variance	Sum of squares	sd	Squares Average	F	Р	Fark
1. Commitment	21-30	152	4,28	intergroup	,870	3	,290			
to advanced	31-40	125	4,35	within-group	134,054	345	,389	- 746	525	
consciousness	41-50	58	4,28	Total	134,924	348		,740	,525	-
	51 and over	14	4,11					_		
2. Commitment	21-30	152	4,01	intergroup	1,603	3	,534	_		
to colleagues	31-40	125	4,10	within-group	144,793	345	,420			
	41-50	58	3,91	Total	146,396	348		1,273	,284	-
	51 and over	14	4,08					-		
3. Commitment	21-30	152	4,16	intergroup	3,876	3	1,292			
to teaching	31-40	125	4,11	within-group	222,873	345	,646		114	
profession	41-50	58	3,87	Total	226,749	348		2,000	,114	-
	51 and over	14	4,00					-		
4. Commitment	21-30	152	3,81	intergroup	4,304	3	1,435			
to the	31-40	125	4,04	within-group	173,859	345	,504	-	020	1.0
the school	41-50	58	3,96	Total	178,164	348		- 2,847	,038	1-2
	51 and over	14	4,10					_		
	Seniority									
1. Commitment	1-2 year	75	4,23	intergroup	1,439	4	,360			
to advanced task consciousness	3-7 year	98	4,36	within-group	133,485	344	,388	,927	,448	
	8-12 year	106	4,32	Total	134,924	348		_		

Table 3. ANOVA results of teachers' commitment subdimensions with respect to age, professional experience and title



	13-17 year	36	4,34							
	18 year and over	34	4,17							
2. Commitment	1-2 year	75	3,95	intergroup	,836	4	,360			
to colleagues	3-7 year	98	4,07	within-group	145,560	344	,388			
	8-12 year	106	4,03	Total	146,396	348			740	
	13-17 year	36	4,05					— ,т/т	,740	
	18 year and over	34	4,09							
3. Commitment	1-2 year	75	4,18	intergroup	3,287	4	,822			
to teaching	3-7 year	98	4,17	within-group	223,462	344	,650			
profession	8-12 year	106	4,04	Total	226,749	348		1 265	283	
	13-17 year	36	3,92					1,205	,205	
	18 year and over	34	3,95							
4. Commitment	1-2 year	75	3,65	intergroup	8,302	4	2,075			
to the	3-7 year	98	3,98	within-group	169,862	344	,494			
the school	8-12 year	106	3,96	Total	178,164	348		4 203	002	1-2.4
	13-17 year	36	4,14					.,200	,002	,.
	18 year and	34	4,04							
	over <b>D</b> agition									
1.0		50	4.00	• ,	1.072	2	(2)(			
to advanced task	teacher	59	4,28	intergroup	1,273	2	,636			
consciousness	teacher	266	4,32	within-group	133,651	346	,386	1,648	,194	
	Expert teacher	24	4,09	Total	134,924	348				
2. Commitment	Candidate	59	3,96	intergroup	1,848	2	,924			
to coneagues	teacher	266	4,07	within-group	144,548	346	,418	2,211	,111	
	Expert teacher	24	3,81	Total	146,396	348	·			
3. Commitment	Candidate	59	4,25	intergroup	4,578	2	2,289			
to teaching	teacher			0 1				- 0 5 6 5	0.00	1.0
profession	teacher	266	4,08	within-group	222,171	346	,642	3,565	,029	1-3
	Expert teacher	24	3,73	Total	226,749	348				
4. Commitment	Candidate	59	3,70	intergroup	3,884	2	1,942			
to the	teacher	766	2.00	within arous	174 200	216	504	- 3,855	.022	1-2
the school	Export toochor	200	2,98	Total	179 164	240	,304		,	_
	Expert teacher	∠4	3,71	TOTAL	1/0,104	540				

The analysis results showed that age (F (3, 345)=2,847, p<.05) and professional experience (F (4, 344)=4,203, p<.05) created a significant difference in teachers' *commitment to school development* scores, while title caused a significant difference in their *commitment to the teaching profession* (F (2, 346)=3,565, P<.05) and *commitment to school development* (F (2, 346)=3,855, p<.05) scores. According to the results of the Scheffe test performed to find the groups that created the significant difference, the commitment levels of teachers with 1-2 years of professional experience ( $\overline{X}$  =3,65) were more negative than those of teachers with 3-7 ( $\overline{X}$  =3,98) and 13-17 ( $\overline{X}$  =4,14) years of experience. Considering the title variable, teacher candidates had more positive *commitment to the teaching profession* ( $\overline{X}$  =4,25) than expert teachers' ( $\overline{X}$  =3,73). In the *commitment to school development* subdimension, teacher candidates had more negative scores ( $\overline{X}$  =3,70) than those of practising teachers' ( $\overline{X}$  =3,98). The Bonferroni test was performed to find the groups between which the significant difference existed for the variable of age, and the results showed that the scores of teachers aged between 21-30 years ( $\overline{X}$  =3,81) were more negative than those of teachers aged between 31-40 years ( $\overline{X}$  =4,04).



# 4. Table 4 displays the results of the analyses regarding the question "Is there a significant relationship between the subdimensions of the organizational commitment scale and secondary school teachers' ages?"

			1	2	3	4	5	6
1.Year	Pearson	Correlation	1	-,023	-,015	-	,120*	-,007
	Sig.	(2-tailed)		,664	,780	,113*	,025	,899
	N		349	349	349	,035	349	349
						349		
2. Commitment to	Pearson	Correlation	-,023	1	,604*	,580*	,602*	,809**
advanced task	Sig. (2-ta	iled)	,664		*	*	*	,000
consciousness	N		349	349	,000	,000	,000	349
					349	349	349	
3. Commitment to	Pearson	Correlation	-,015	,604**	1	,583*	,574*	,828**
colleagues	Sig. (2-ta	iled)	,780	,000		*	*	,000
-	N		349	349	349	,000	,000	349
						349	349	
4. Commitment to	Pearson	Correlation	-	,580**	,583*	1	,536*	,789**
teaching	Sig. (2-ta	iled)	,113*	,000	*		*	,000
profession	N		,035	349	,000	349	,000	349
			349		349		349	
5. Commitment	Pearson (	Correlation	,120*	,602**	,574*	,536*	1	,837**
to the	Sig.	(2-tailed)	,025	,000	*	*		,000
development of	N		349	349	,000	,000	349	349
the school					349	349		
6. The Full Scale	Pearson	Correlation	-,007	,809**	,828*	,789*	,837*	1
	Sig.	(2-tailed)	,899	,000	*	*	*	
	N		349	349	,000	,000	,000	349
					349	349	349	
*Correlation is sign	ificant at th	ne 0.05 level (	2-tailed).					
**Correlation is sig	nificant at	the 0.01 level	(2-tailed	).				

Table 4. Correlations among Variables

Correlation analysis is a statistical method used to test the linear relationship between two variables or that between a variable and two or more others, and to measure the level of any existing relationship.

According to Table 4, a low, negative and significant relationship existed between teachers' ages and commitment to the teaching profession (r=-0.11, p<.05), and the correlation coefficient showed that as age increased, commitment to the teaching profession decreased. On the other hand, a low, positive and significant relationship existed between age and commitment to school development (r=0.12, p<.05), and the correlation coefficients showed that as age increased, so did commitment to school development. The determination coefficients ( $r^2$ =0.012,  $r^2$ =0.024) showed that age accounted for 1,2% of the total variance in the commitment to the teaching profession behavior and 2,4% of that in the commitment to school development behavior. There was a high, positive and significant relationship (r=0.80,r= 0.82, r=0.78 and r=0.83, respectively) between the subdimensions and the entire scale. Between the subdimensions too, a moderate, positive and significant relationship wasseen.

#### CONCLUSIONS

The study explored the commitment feelings of secondary school teachers with respect to age, gender, years in the profession, title, subject area, and work place. The findings of the study are discussed here with reference to the existing literature. While teachers stated they were "always" committed to an advanced sense of duty, they stated to be "often" committed to their colleagues, to the teaching profession and to school development. In the commitment to the teaching profession subdimension, there was a difference in favor of males. In other words, male teachers stated at a higher level than females that they would stay in the teaching profession even if they did not need it financially, that they were proud of the profession, that they saw it as an ideal profession, that they sought recognition in the profession, and that it was the most positive decision they made in their lives. Cengiz, Turgut and Kabakçı's (2014) study found a result in favor of males in the commitment of lecturers to the profession, to instructional work and to the study group subdimensions.

These results are similar. Other corroborating studies have been conducted by G1c1, 2011; Güner, 2006; Kutlay, 2012; Narman, 2012; Topaloğlu et al. 2008. In the commitment to school development subdimension, a significant result in favor of married teachers was found.

The commitment to school development levels of teachers with professional experience of 1-2 years was significantly more negative than those with 3-7 or 13-17 years of experience. In other words, as experience increased, so did commitment to school development levels. Corroborating results have also been obtained by Atar, 2009; Karagöz, 2008; Güner, 2006; Kutlay, 2012; Demirhan, 2010; Taşçı, 2011; Kurtbaş, 2011; Güçlü and Zaman, 2011; Yılmaz, 2009. On the other hand, Cengiz, Turgut and Kabakçı (2014) concluded in their study that individuals' commitment scores did not vary significantly based on years spent working.

With respect to the variable of title, teacher candidates were more positive than practising teachers in the commitment to the teaching profession subdimension. According to the results of a study by Cengiz, Turgut and Kabakçı (2014), research assistants had higher "commitment to the profession" than instructors, lecturers, assistant professors, associate professors and professors. Boylu et al. (2007) found that academics with the professor title had lower loyalty levels than research assistants. These results are parallel to those of the present study. In the commitment to school development subdimension, teacher candidates had more negative scores than teachers. According to the results of a study by Cengiz, Turgut and Kabakçı (2014), however, research assistants had higher "commitment to school" than lecturers and professors. This finding is in conflict with those of the present study. In the same subdimension, the scores of teachers aged between 21-30 years were more negative than those of teachers aged between 31-40 years. While studies by Cengiz, Turgut and Kabakçı 2014; Atar, 2009; Gıcı, 2011; Güner, 2006; Kutlay, 2012; Topaloğlu et al., 2008; Artun, 2008; Arslan, 2013 concluded that age did not have any significant effect, certain other studies found a significant relationship (Apak, 2009; Karagöz, 2008; Narman, 2012; Demirhan, 2010; Ekenci, 2012; Taşçı, 2011; Kurtbaş, 2011). According to this data, as age increased, so did commitment to school. This may suggest that as teachers got older and gained more work experience, they started to harbor more positive feelings for the profession.

Teachers responded "sometimes" to the following item in the commitment to school development subdimension: "I would willingly teach a course outside my subject area to stay in the school". In Celep's (1998) study, 62.6% of the teachers stated in response to the same item that they would prefer to teach at another school if their own school did not give them the opportunity to teach their own subject area. The results are similar. Even though teachers gave high scores to the commitment to school development items "I make more effort than expected for the school" and "I care about the future of the school", they scored lower in the item about wishing to teach a different course in order to stay in the school, thus showing that this item has the smallest effect on commitment. The results of Celep (1998) were also similar to these in the same items.

The arithmetic means of teacher responses in the advanced sense of duty subdimension revealed that they were "always" committed to an advanced sense of duty in three items and "often" committed to it in two items. Teachers were found to make a lot of effort to successfully do tasks in this subdimension at the school. Similarly, Celep (1998) also found that teachers particularly enjoyed higher level instructional tasks and made a superior effort to perform these tasks at school.

Teachers responded "always" to one item in the commitment to the teaching profession subdimension, and "often" to four items. Celep (1998) found that teachers were strongly committed to the teaching profession. In the commitment to colleagues subdimension, teachers stated they "always" avoided creating problems for their colleagues, helped their colleagues willingly in solving their work-related problems and felt proud of their peer teachers. In the remaining five items, the respondents stated to be "often" committed to their colleagues.

Between teachers' ages and commitment to the teaching profession subfactor was a low, negative and significant relationship. The correlation coefficient showed that as age increased, commitment to the teaching profession fell. On the other hand, a low, positive and significant relationship existed in the commitment to school development subfactor, showing that as age increases, so does commitment to school development. Considering determination coefficients, it may be stated that age accounted for 1,2% of the total variance in commitment to the teaching profession behavior, and 2,4% of the total variance in commitment to school development behavior. A high, positive and significant relationship existed between the subdimensions of the scale and the entire scale, while a moderate, positive and significant relationship existed among the subdimensions.

Recommendations based on the results of the study are as follows:



1. Teachers wish for national education directorate employees to treat them respectfully and for administrators to help them.

2. Teachers state that inadequate salaries and payments lower their work satisfaction. The Ministry of Education may consider this and improve payments by bringing a performance-based system base don multiple data sources. In addition, career stage exams in the teaching profession may be made more functional.

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# Partnership with Parents as a Fundamental Prerequisite for the Realization of a Quality Educational Process of the Kindergarten

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## SUMARRY

Parents are the most important co-workers in the education of their children in the kindergarten, therefore, they should be involved in its work in various ways. These can be parental meetings, workshops, individual conversations, and the like. They contribute to the realization of a partnership with parents that is extremely important for achieving a common goal, which is child welfare. In this paper, we will describe the way in which we facilitate the adaptation of children to the educational institution, enhance their commitment to preschool teachers, develop trust, openness and tolerance by means of working with the children's parents. Partnership with parents is one of the fundamental prerequisites for the realization of a quality educational process of the kindergarten.

#### INTRODUCTION

A partnership between an educational institution (kindergarten) and parents (family) is a prerequisite for an optimal development and learning of a child. A quality relationship between these factors has a positive influence on a child and its welfare. Parents are the primary care givers in a child's life and they want the best for their child, therefore, they want to be included in its growth and development. In modern world children spend most of their time in educational institutions and because of that fact, it's of most importance for the parents to be included in all the events regarding their child's education and upbringing. A partnership is built on a solid base made by the strongly motivated preschool teachers who are the main initiatiors of building partner relationships with the parents (family). Parents should be able to feel welcomed and accepted in a kindergarten at any time which results in a pleasant environment and communication, with the main goal still being children's welfare.

## STUDY

There is a number of definitions of the term partnership in the preschool literature, and the one common thing is that the term partnership includes honour, respect, belief, open communication, flexibility, active listening, sharing information and nonjudgmental attitude. It is often that the term partnership is equalized with the term collaboration. The author Ljubetić (2014., pg. 5, acc. to Pašalić-Kreso, 2004.) emphasizes that "collaboration developes and nurtures mostly superficial and formal relationships which, no matter how frequent they are, can't bring qualitative changes" if the communication between parents and the educational institution doesn't change pertinently. Also, the same author (pg. 6) accents that the main characteristic of collaboration relationships between parents and the preschool institution is the hierarchy of the relationship ,,where the institution takes higher place, which implies the unequalness of the partners in the relationship". In a partnership the child and its welfare are in the first place and by families and kindergartens working together, it is for the best for the child, *"In a partnership, the family and the institution put the child, it's wellbeing, it's needs* and potentials in the centre of attention by both parties which have the same interests, goals and tasks" (Ljubetić, 2014, pg. 6). In the book The Hundred languages of Children, in an interview with the author Gandini, the author Spiaggari speaks not only about the children that have possibilities, ideas, knowledge and competencies, but also about their parents. Moreover, the author considers the preschool to be the blamed if the parents aren't included and do not cooperate in the educational process of the preschool.

The partnership between the kindergarten and the parents is considered to be the one of the main principles of The National curriculum for the Preschool Education which is being practiced in the Republic of Croatia since 2015. It is an official document which contains the fundamental values of the preschool education of children in kindergartens. The starting points of this document are the principles of freedom, openness and diversity, which



should reflect on the totality of the organization and work process in all of the kindergartens across Croatia. The National Curriculum for the Preschool Education (2014) perceives the family and the kindergarten as two basic systems in which a preschool child developes and grows, and their partnership is the result of quality interaction between those two factors. *"Quality and reciprocal communication allows the parents and the preschool teachers better understanding of the children, which neither of those two could acquire alone without the help of the other*." (Slunjski, 2012, pg. 129).

Considering the parents to be the most important partner in the upbringing and education of their children in the preschool education institutions and the most important representatives of their children's interests, it is crutial to encourage them to be included in the educational process of the kindergarten from the beginning, from the moment the children were enrolled in the kindergarten. *"The modern interpretation of the partnership represents a turn in the understanding of the way of thinking about parents, their role, wellbeing, their engagement...*" (Ljubetić, 2014, pg. 9).

A preschool institution should be a place where all the parents could feel welcomed, accepted and appreciated. There are various ways that the preschool teachers can approach the parents and from there build a solid base of partnership. The author Slunjski (2001) says that the daily interactions between parents and preschool teachers, their immediate involvement in the work of the kindergarten, mutual conversations about nurturing and psychological problems, their participation in various events, fieldtrips, celebrations, involvement in the advisory council of the kindergarten, are only the few possible ways of creating a bond between the parents and the kindergarten.

The role of the preschool teacher is the most relevant for the parents to be actively involved in all of the aspects of a daily functioning of the kindergarten and for them to become equal members of the team in a preschool education institution. In the beginning, when the child first starts to go to the kindergarten, initiatiors of an interaction with the parents are usually the preschool teachers and with time that role should be equally divided. With a two-way professional activities of the preschool teachers: one for the children – by implementing the programs of the preschool educational system; and one for the parents – by using different methods and styles of cooperation of the family and the preschool education professionals, there can be created more favorable conditions for the development of the child's personality, the principle of unity of influences can be achieved, parents can become equal during this process and there can be a continuity in the educational process; by doing all of the above, there are more benefits of the preschool work (Bašić and co., 2005).

# Meetings with parents function as an opportunity to create a partnership bond between parents (family) and preschool teachers (kindergarten)

By going to the kindergarten a child faces a new and unknown situation which the child has not had the chance to experience before. The child is then faced with a new social environment which is different than its primary social environment (family). These two environments are very important for the child so there is a need to bring them closer to each other (Bašić and co., 2005). The topics for the parents – preschool teacher meetings choose the teachers by knowing well the parents, their interests and wishes. From the moment of its birth to the moment of going to school, a child experiences three phases of development, and for a child to overcome successfully all of the phases it is important for the parents and the preschool teachers to establish a successful communication (Milanović, 2014). These meetings are about planning celebrations, fieldtrips, workshops, about the contribution of the parents on projects, their daily involvement in the work of a group, and themed parents – preschool teachers meetings.

The very first parents – preschool teachers meeting (the first time the family meets the preschool teachers) is an opportunity for a solid collaboration on which they can build a strong foundation of the partnership. To some parents this is the first time they have encountered an educational institution so the information they will receive is of most importance. The first parents – preschool teachers meeting includes information such as introducing the kindergarten house rules, kindergarten meal plans, having spare clothes and shoes for the child, bringing toys from home, having a corner for the parents (a pinboard with information). The parents will receive useful information about working hours of the kindergarten, safety and health protocols, and many more. The given



information will calm the parents and become the foundation for building a positive relationship with the kindergarten.

Also, in the first parents – preschool teachers meeting it is wise to introduce the parents with the adjustment process that every child will go through in its own way and that is possible (and normal as well) that in the beginning the child will cry while separating from the parents and while staying with others in a group, that it will protest and be resignated or closed off. These changes will pass, in some children sooner and in some later. The partnership and relationship between the parents and teachers can have a positive effect on the adjustment period because together they can determinate the child's habits and all other facts that will help in the child – teacher and teacher – child relationship, and also provide the child with an easier and quicker adjustment in the newly developed situation. Every child is different so it will undergo this adjustment period differently. Besides the emotional reactions (sadness, irritability, anger) there could also appear some behavioral changes (crying, agression, detachment) and some physical reactions (urination – going back to a previous phase of development, pain, going back to the pacifier etc.). Collaboration with the parents is crutial so that this period can pass as painless as possible. By daily communicating and passing on information from home or from kindergarten it is made sure that the possible problems can be overcomed in a quality way.

#### Daily communication between parents and preschool teacher

Parents need to be included continuously in the work of the kindergarten and a quality partnership requires them to be informed (by reading booklets, leaflets, communication on the internet, exchanging notes or documentation on the child, workshops, discussion groups etc.) and by doing so the parents are supported and empowered in their role as a parent (National Curriculum for the Preschool Education, 2014). Mutual informing is achieved by daily and informal talks between parents and teachers and by communicating through the corner for the parents (pinboard). The preschool teacher refers the parents of the new children to this pinboard with all the fundamental information until it becomes a habit, and the parents on their own get informed about the current events in the kindergarten. These pinboards for the parents give insight in the life and work of a preschool group, current events, notice and information. There can be also found letters of thanks for the parents, photographs of the meetings or get togethers etc.

For building a mutual trust the most contribution goes to the atmosphere in the institution which allows the parents to feel welcomed and where their involvement is being seen as important and valued for their child's welfare. If the parents feel welcomed it will have a positive impact on their children and it will contribute to the quality of the entire life in the kindergarten.

#### Pleasant environment and the feeling of being welcomed

Parents are the primary educators of a child "and in a kindergarten – a learning community, they are the vital partners for creating complete understanding and knowledge of the children" (Slunjski, 2008, pg. 209).

During the whole pedagogic year parents should be dear guests in the children's groups. Parents of different occupations can in a fun and educational way present their jobs (a police officer, a dentist, a doctor, a cook, a musician). It's good to have the meetings with parents, workshops or individual talks in the living room of the kindergarten group because that way the parents can get an insight about the space in which their child will be spending a lot of time in the future. This way, by observing the space the parents can already presume (based on knowing their child well) will their child be able to find something interesting for itself; that is, with the teacher they can arrange what could be in the centre of attention and interest for the child in those early days of going to the kindergarten. The living area of the room is divided into smaller centres of activities which originate by knowing the children well, their needs, capabilities and interests. "A space transmits many messages, and the most important one is that adults organized this place for the children having in mind quality learning, and that they have organized it so it can give a sense of freedom and an opportunity to comfortably socialize, and with its instructive dimension it can encourage new explorations" (Slunjski, 2001, pg. 37). The described space should be an indicator of the "life of the group", it should be a space that is enriched with incentive materials, children's work of arts, with their statements, constructions and all of the things that show us the presence of children in it. The author Slunjski (2008) addresses the importance that should be given to the parents when they come to the



kindergarten every time. Parents should always feel welcomed in the kindergarten, they can spend time with their children and get to know their friends, participate or observe their children during activities, talk to the teachers or other parents. By including the parents in working on the kindergarten projects, the partnership bonds are becoming stronger among all of the educational process factors and the parents become equal participants of the educational process which their child goes through in kindergarten.

#### **Individual talks**

Modern goals of education are focused on the personal needs of the children and individual monitoring of every single child is an indicator that the reform guidelines of the early and preschool education are applied. The preschool teachers keep records in individual developmental folders for every child in their group so they can monitor their development and also as a tool for organizing activities for the child. Apart the preschool teachers it is also important the help of the parents while collecting the information about the child (basic information, photographs, anectodal notes, drawings from home). Individual parent – teacher talks allow the parents to have an insight into development and activities of the child in the kindergarten and also provide a much closer and more open conversation. Parents can ask anything about their child in this stage, resolve a possible concern and settle with the teacher a plan for further development and growth of their child. The documentation collected and gathered in the child's individual developmental folder allows the parents to observe different forms of educational activities in kindergarten and that is important for understanding the ways that their child is learning, building its knowledge and understanding, how it uses certain materials, how the child cooperates with the teacher and other children, what interests the child etc. It's interesting to the parents to see the child from another perspective different from the one that they are used to see in the family environment. Often a video, photograph or statements of the children about a certain "problem" can cause emotional reactions in parents. This type of communication with the parents requires a peaceful space and time so it is best to arrange a realization plan with the parents in the beginning of the pedagogic year. The parents are equal participants in the educating and raising their children and they are the main allies of the preschool teachers in accomplishing an overall quality life in the kindergarten. The individual developmental folders can be the foundation of the development of a strong partnership between families and preschool teachers and to the children they bring joy and are useful in the learning process. When the mentioned folders are placed in a visible place in the living area of the room and are available to the children in any given moment, then their existence has great value because it supports the process of their learning. According to the author Slunjski (2008) the level and the quality of parent's involvement in the educational process is relevant for the development of the child, but also for the institution aswell.

#### Surveys for the parents

It is very useful to give out to the parents anonymous surveys about the work of the kindergarten in the beginning and in the end of a pedagogic year. The surveys can include questions about the parent's contentment with the kindergarten and also about their expectations, and the feedback can help the preschool teachers in making further educational plans and programs. A partnership relations with the parents develop, are build upon and last during the whole time that the child is in the kindergarten. It is necessary to include the parents in as many acitivities possible in the kindergarten and show them that their opinions are valid and important.

#### Workshops for parents and children

One of the possible forms in which the partnership can be generated are themed and/or educational workshops which are created by the preschool teachers once they have an insight in a family, that is, once they identify interests, wishes, needs, goals and possibilities of a certain family, and all of the above serves to enhance the quality of the child's life. In the creative workshops parents and children will spend quality and funfilled time which will have a positive impact on the child. In this type of situation the child can see the union between their parents and teachers and it can feel pleased and relaxed, proud, safe and accepted. That is the main reason why kindergartens often implement various types of workshops. It is possible to organize with the parents workshops and set a goal of configurating the space and material context of the preschool group. That way the parents feel that they are part of the entire kindergarten's curriculum, that their help is valued and important, and that they are inevitable participants of all the kindergarten's events. With the help of the parents there could be produced



#### CONCLUSION

A child's cognitive, social, emotional and biological growth and development influence the interactions in the family-institution system bringing them to different levels of intensity, frequency and interactions between them (Ljubetić, 2014). A partnership with the parents is of crutial importance in acheiving the common goal – child's welfare, and the effects of these relations are: children adapt faster to the kindergarten, develop attachment to the preschool teachers, trust, openness and tolerancy. The partnership relations are more than a simple cooperation and for that to be achieved it is required a lot of effort, motivation and open conversations in both parties, but also a lot of competence of the teachers. A child's social, emotional and cognitive development will be easier if it is based on a continuity in the interactions and participation of the educational institution (kindergarten) and family (parents).

"In a kindergarten – a learning community, parents are essential partners creating together a wholesome understanding and knowledge of the children. They are equal participants in the education of the children and the main allies of the preschool teachers in accomplishing a quality of life in the kindergarten" (Slunjski, 2008, pg. 209).

A partnership between parents and the kindergarten will allow the parents to understand better their child, the ways in which it is learning, it is building its knowledge and understanding, how the child cooperates with other children and the teachers; also, it will give the parents useful information on how to act and motivate the child to develop overall in a family environment. Thanks to the partnership relations with the parents, the preschool teachers will get acquainted well with the parents, with their principles and opinions regarding the child's development, family environment in which it lives, family's habits etc. In the modern world many developed societies encourage more quality engagement of the parents in the life of the community, especially in the life of the educational institutions, by which they support critical reflection, analysis, creating opinions and democratic representation of the child's interests and their own (Ljubetić, 2012). A high level of partnership between the parents and the kindergarten results in high accomplishments in children, higher parenting competencies, and therefore the described partnership requires a lot of attention.

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# Percepton of Academic Administrators on Strategies for Promoting Positive Information and Communication Technology (Ict) Compliant School Climate in Nigeria

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#### ABSTRACT

Information and Communication Technology (ICT) is a useful tool to find, explore, analyze, exchange and present information. It can be employed to rapidly access ideas and experiences from a wide range of people, communities and culture. It builds, promotes and strengthens positive organizational climate. Electronic media is playing an important role in transmitting communications. Telephones, handsets and media systems such as television, voice activated computers, multimedia software, fax machine and a host of other electronic devices are used to create more effective communication which in turn promote positive school climate and reduce or completely eliminate organizational conflicts. This study is guided by two research questions. A descriptive survey design was employed in the study. It sought to study the perception of both male and female lecturers on strategies that promote the use of ICT in Colleges of Education in Anambra State. A stratified random sampling technique was adapted for selecting the Heads of Department, Deans and Directors of programmes. The sample consists of twenty six respondents.

The instrument used for data collection was a questionnaire titled Strategies for Enhancing Information and Communication (ICT) use in Anambra State College of Education (SEIQ). The instrument is a 7 - item Likert-type instrument scored on a 4-point scale. The internal consistency reliability of the instrument using Cronbach Alpha was established at 0.93. Data collected was analyzed using mean score and standard deviation for answering the research questions. A score of 2.50 and above was taken to mean that the respondents is in agreement with the option while a mean of 2.49 and below showed disagreement to the items of the instrument. T-Test statistic was used at 0.05 level of significance to test the hypothesis. The results of the study showed that improved power supply ,training/retraining of staff and ICT resources made available with mean of 3.6154;3.3077 and 3.2692 are factors promoting positive ICT school climate and the rate of diffusion of ICT innovation in the colleges of education in south east and the reasons for that.

Key words: Positive school climate, Strategies and Information Communication and Technology

#### INTRODUCTION

We are living in a world with vast industrial and technological breakthroughs. Information and Communication Technology (ICT) is important in a changing world in which work and other activities are increasingly becoming complex and transformed by access to varied and developing technology. ICT is a useful tool to find, explore, analyze, exchange and present information. It can be employed to rapidly access ideas and experiences from a wide range of people, communities and culture. It builds, promotes and strengthens positive organizational climate.

Information and communication technology (ICT) is an umbrella term that covers all advanced technologies in manipulating and communicating information. It facilitates the management processes of planning, organizing, leading, controlling and coordinating the activities of the institutions. The use of ICT in both instructional and administrative service delivery in our colleges of education will help improve academic performance of students as well as the effective and efficient administrative capabilities of the administrators. However, there is evidence of poor academic planning in some colleges of education where a lecturer may be expected to teach, evaluate and manually mark theory scripts of two or three courses with a population of about four to six hundred students within a very short period of time.

Electronic media is playing an important role in transmitting communications. Telephones; handsets and media systems such as television, voice activated computers, multimedia software, fax machine and a host of other electronic devices are used to create more effective communication which in turn promote positive school climate and reduce or completely eliminate organizational conflicts. A positive school is an enabling atmosphere for learning. It includes the feelings people have about the school as a place where effective teaching learning can take place. Electronic mail (e-mail) as well as some other social networks like the face book are fast and cheap and can be used to send the same message to several people (Mormah, 2010). It is getting obvious as we head towards the



magical year 2020, that preventable information, communication and records management problems which appear to still be a nightmare to several school organizations due to lack of access to ICT facilities, basic knowledge of ICT usage and actual utilization of ICT facilities. Sapru, (2009) stated that the success of any organization is dependent upon many factors, but none is as important as the impact of its leader. Good Administration is often said to rest greatly in the hands of the school administrator whose sole responsibility is to effectively and efficiently coordinate the human and material resources within and outside his organization. One of the ways of achieving this goal is by inventing new strategies for promoting positive information and Communication technology compliant school environment that will enable him achieve the general organizational goals.

Akuegwu, Ntukidem and Ntukidem (2014), quoting Bamiro and Liverpool (2002) observed that the computer (ICT) has already invaded and dominated Universities in the developed world, while in Nigeria it has been painfully slow, hence most school organizations still process results manually. This situation can be brought to halt by employing strategies for promoting positive Information and Communication Technology (ICT) compliant school climate. This study is akin to that of Cox, Preston and Cox (1999) who carried out an almost similar study on what motivates teachers to use ICT. The sample from which the questionnaire was administered consisted of 135 respondents. A total of 82 educators (60.7%) returned the questionnaire. A focus group of 20 teachers and other educators were used to review the results and more detailed explanations relating to the specific responses to questionnaire and other data was given. The findings show that the majority of teachers considered ICT to have improved the presentation of materials, make lessons more fun for the pupils and more interesting for the teacher, make administration more efficient, and give the teacher a greater awareness of its uses. The mean responses for negatively phrased items relating to pupil motivation, benefits for learning, and enjoyment of ICT use, were very low. Given this background, this study is poised to examine the strategies for promoting positive Information and Communication Technology (ICT) compliant school climate in Anambra State, South East Nigeria.

#### PURPOSE OF THE STUDY

The main purpose of the study is to ascertain the strategies for enhancing/promoting positive ICT compliant school climate by academic administrators.

And also to ascertain the perception of academic administrators on strategies for enhancing the use of ICT facilities in the College of Education as a factor for promoting positive ICT compliant school environment with respect to gender.

#### SIGNIFICANCE OF THE STUDY

The study will help to facilitate the use of ICT as a factor for promoting positive ICT compliant school climate. It will also help in achieving a positive perception of promoting an ICT compliant school climate among academic administrators.

#### **SCOPE OF THE STUDY**

This study is a case study of a state college of education in South East Nigeria; Nwafor Orizu college of education, Anambra state. The study includes such variables as the factors constraining and promoting the use of ICT facilities in the college of education in South East Nigeria. The population of the study consist of all academic administrators in the state college of Education. The estimated population of the respondents to the questionnaire were 26 academic administrators and fifteen (15) participants in an interview session. Total population of respondents were forty one (41). Selection of respondents was based on purposive sampling technique.

#### **RESEARCH QUESTIONS**

This study is guided by the following research questions:

- 1. What are the strategies for enhancing ICT use as indicated by academic administrators in Colleges of Education?
- 2. What are the strategies for enhancing ICT use as indicated by academic
  - administrators in colleges of education with respect to gender?



#### **HYPOTHESIS**

H01 There is no significant difference between the mean rating scores on the perception of measures that would enhance the effective utilization of ICT facilities by female and male academic administrators of Colleges of Education.

#### METHODOLOGY

Descriptive survey design was employed in the study. It sought to study the perception of both male and female lectureres on strategies that promote the use of ICT in Colleges of Education in Anambra State.

The Study was conducted in Nwafor Orizu College of Education in Anambra State. Anambra State has only one State College of Education. A stratified random sampling technique was adapted for selecting the Heads of Department, Deans and Directors of programmes. The sample consisted of twenty six respondents.

The instrument used for data collection was questionnaire titled Strategies for Enhancing Information and Communication (ICT) use in Anambra State College of Education (SEIQ). The instrument is a 7 item Likert-type instrument scored on a 4-point scale of (SA) Strongly Agree (A) Agree (D) Disagree (SD) strongly disagree. The instrument has two sections namely: Section A is concerned with personal data of the respondents while Section B contains of 14 -item statements in two clusters on strategies for enhancing ICT use.

The instrument was face validated by two experts from Educational Administration and Planning and Measurement and Evaluation from College of Education Agbor. The internal consistency reliability of the instrument using Cronbach Alpha was established at 0.93

The researcher administered the instrument directly and retrieved same from the respondents.

Data collected was analyzed using mean score and standard deviation for answering the research questions. A score of 2.50 and above was taken to mean that the respondents are in agreement with the option while a mean of 2.49 and below showed disagreement with the items in the instrument using the t-test hypothesis tested at 0.05 level of significance.

#### RESULTS

The results of the analysis for answering the research questions and testing the null hypothesis that guided the study are presented in the tables 1,2 and 3

#### Table 1

Mean response of heads of departments, Deans of Schools and Directors of programmes on ((SEIQ) in Nwafor Orizu college of Education Anambra State.

	8				
	STATEMENTS	Ν	MEAN	SD	DECSION
1	Improve power supply	26	3.6154	.6373	ACCEPTED
2	Training/retraining of staff on	26	3.3077	.7883	ACCEPTED
	ICT				
3	ICT resources	26	3.2692	.6038	ACCEPTED
	Awareness campaign to be				
	carried out by the school				
	management				
4	ICT resources should be made	26	3.2692	.6038	ACCEPTED
	accessible to all the users				
5	Increase time usage of ICT	26	3.3077	.6177	ACCEPTED
	resources				
6	Finance/ imprest should be made	26	3.1154	.9519	ACCEPTED
	available for purchase of				
	bandwidth/maintenance of ICT				
	resources.				
7	Adequate provision of spaces to	26	2.9615	1.0763	ACCEPTED
	accommodate ICT facilities.				
	E al dana ala				

Source: Field work

Table 1 showed that the mean perception of the academic administrators for all the strategies for promoting positive ICT compliant school climate were all above the bench mark of 2.5. This is an indication of the fact that they are all in agreement with the strategies for promoting positive ICT compliant school climate.



#### Table 2

Mean response of heads of departments, Deans of Schools and Directors of programmes on (SEIQ) in Nwafor Orizu college of Education Anambra State with respect to gender.

		ALE							
-	STATEMENTS	Ν	MEA N	SD	ACCEPTE D	Ν	MEA N	SD	ACCEPTE D
8	Improve power supply	12	3.6667	.4923	ACCEPTE D	14	3.571 4	.7559 3	ACCEPTE D
9	Training/retraining of staff on ICT	12	3.4167	.9003	ACCEPTE D	14	3.214 3	.6992 9	ACCEPTE D
10	ICT resources Awareness campaign to be carried out by the school management	12	3.5000	.52223	ACCEPTE D	14	3.071 4	.6157 3	ACCEPTE D
11	ICT resources should be made accessible to all the users	12	3.3333	.65134	ACCEPTE D	14	3.214 3	.5789 3	ACCEPTE D
12	Increase time usage of ICT resources	12	3.3333	.49237	ACCEPTE D	14	3.285 7	.7262 7	ACCEPTE D
13	Finance/ imprest should be made available for purchase of bandwidth/maintenance of ICT resources.	12	3.1667	.93744	ACCEPTE D	14	3.071 4	.9972 5	ACCEPTE D
14	Adequate provision of spaces to accommodate ICT facilities.	12	2.6667	1.0730 9	ACCEPTE D	14	3.214 3	1.050 90	ACCEPTE D

#### Source: Field Work

From the table 2 above, the mean responses for the strategies for promoting positive ICT compliant School climate are all above the mean criterion of 2.50. This implies that there responses are in agreement with the seven strategies.

# Table 3; T-test Analysis of Mean Response scores of Male and Female academic administrators perception on strategies for promoting ICT compliant school climate

**T-Test** 

GENDE R	N	Mean	Std. Deviation	DF	Teal.	SIG	DECISION
FEMAL E	12	3.297	0.5457				
MALE	14	3.2345	.5392	24	.295	.771	ACCEPTED

Table 3 showed that the t-calculated .295 (df=24) is not significant at .05 level of significant. Hence, the null hypothesis, which states that there is no significant difference between the mean rating scores on the perception of measures that would enhance the effective ICT compliant school climate by female and male academic administrators of colleges of education is accepted.

From the table 3 above, there is no significant difference between the mean rating score of perception of male and female academic administrators to the strategies of promoting ICT compliant school climate in Nwafor Orizu college of Education, Nsugbe Anamabra State.



#### DISCUSSION

The findings of this study confirmed that administrators can contribute to promoting positive ICT compliant school climate by employing the strategy of improving power supply in their schools, training & retraining their staff, ICT resources Awareness campaign to be carried out by the school management, ICT resources should be made accessible to all the users, Increase time usage of ICT resources, Finance/ imprest should be made available for purchase of bandwidth/maintenance of ICT resources and Adequate provision of spaces to accommodate ICT facilities.

This study is line with Enaohwo (2000) who recommended constant plant/facility improvement and renewal to meet present needs of users. This can only be done when school administrators have plans and strategies to achieve success and the government adopts measures of promoting positive school climate through provision and maintenance audit to audit ICT and other facilities in schools.

The result of this study portray reality based on the interview with the fifteen participants in which they expressed their disatisfaction with the state of ICT use in the instition.

Sapru, (2000) concurring with Enaohwo's view stated that the success of any organization is dependent upon many factors, but none is as important as the impact of its leader's ability to mobilize the human and material resources within his organization. The study is also akin to that of Cox, Preston and Cox (1999) who carried out an almost similar study on what motivate teachers to use to use ICT.

The findings show that the majority of teachers considered ICT to have improved the presentation of materials, made lessons more fun for the pupils and more interesting for the teacher and made administration more efficient.

It is also noted that both male and female did not differ in their perceptions.

#### CONCLUSION

This study is set to identify the perception of academic administrators on the strategies for promoting positive ICT compliant school climate in South East Nigeria. The findings in this study confirmed that administrators can contribute to promoting positive ICT compliant school climate by employing these strategies.

#### RECOMMENDATIONS

On the basis of the findings and conclusion of the study, the following recommendations are made:

- 1. Power supply should be improved in our educational institutions
  - 2. School management should carry out training and retraining of academic staff on ICT.
  - 3. ICT resources should be made available to all users.

**4.** Finance/imprest should be made available for purchase of bandwidth/maintenance of ICT resources and there should be adequate provision of space to accommodate ICT facilities

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# Performance-Based Tasks as a Mean to Assess the Speaking Skills of Learners of English as a Foreign Language

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## ABSTRACT

Performance-based tasks enable students' to demonstrate their learning progress in authentic ways. They also provide foreign language teachers with opportunities to challenge their students to use the language and therefore, assess the development of their skills. Acknowledging the advantages that these activities provide, this work aims at suggesting a set of performance-based tasks to evaluate the speaking skills of students of English as a Foreign Language.



Examples of performance-based tasks that have been implemented with Spanish speakers learning English illustrate how these tasks can be put into practice. For the development of the work, the authors conducted a review and analysis of articles, texts and other sources that included relevant information to the subject, including theoretical foundations, educational policies on evaluation, and examples of performance-based tasks. Suggested performance-based tasks include oral presentations, discussions, debates, demonstrations, among others. Both literature and the authors` experience indicate that performance-based tasks boost students` confidence and motivation towards speaking. Most performance-based tasks for assessing students' oral skills are collaborative in nature. Nonetheless, they can be also adjusted to individual assessments.

Keywords: Student evaluation, speaking skills, language teaching, EFL, Ecuador.

#### **INTRODUCTION**

The goal of making changes within the public educational system in most parts of the world demands among other transformations, the adoption of teaching-learning approaches that incorporate suitable strategies aimed at stimulating students' linguistic and cognitive development as well as knowledge construction in real-life-like situations. This intention also requires the adoption of other forms of assessment to appraise students' performance throughout their learning process. Said forms of assessment are different to the traditional paper-based tests applied at the end of a course.

For example, the Ley Organica de Educación Intercultural (Law of Education of Ecuador, mostly referred as LOEI) (LOEI, 2011a) defines students' assessment as an ongoing process that includes a set of steps such as observing, valuing, and registering data from the teaching-learning process. This data is expected to reflect the students' achievement. It should provide a guide for giving students the necessary feedback they need to help them improve their academic performance at the appropriate time. Likewise, students' evaluations should include evaluation tools in different formats and not only the traditional written exams (LOEI, 2011b).

When assessing the language knowledge/skills development of individuals who have to learn a foreign language as a requirement of their school curriculum, teachers have to consider several factors. For instance, most learners do not feel motivated to learn the language and even less to be evaluated by means of traditional tests. The only place where the majority of students have access to practicing and using the language, as well as receiving feedback on their language skills improvement is in the classroom. With this in mind, foreign language teachers should seek for alternatives to evaluate their students in a way that they have the possibility of demonstrating their skills development in-use. Therefore, the purpose of this work is to suggest a set of performance-based tasks to evaluate the speaking skills of students of English as a Foreign Language. Examples of some of the strategies in-use accompany the activities proposed.

## ASSESSMENT OF LEARNING

#### Overview

Assessment is referred to as a process that entails obtaining information which is of interest to a person through the application of a series of continuous and considerable methods (Bachman, 2004). In a scholastic environment, teachers are to make decisions about their instructional practices as well as how students' achievement should be graded or reported. These decisions have to be grounded on the results obtained from evaluations to the level of progress students' have gained within a study period with respect to the learning goals set by the teacher (Cheng, Rogers, & Hu, 2004). Consequently, students should be assessed consecutively enabling teachers to reflect upon the assessment outcomes and to use them as a filter to improve the teaching-learning process (Fulcher & Davidson, 2007).



Many forms of assessments have been proposed throughout the years. To give an example, besides the classification of types of assessment by its purpose–instructional, predictive, diagnostic, and evaluative- that Caffrey (2009) establishes, he also points out two other types of assessment: formative and summative assessments. Caffrey defines formative assessments as "those that are used during the learning process in order to improve the curriculum and instruction" (p.7). On the other hand, "summative assessments are those that are used at the end of the learning process to "sum up" what students have learned" (Caffrey, 2009, p.7). The Ley Organica de Educacion Intercultural (LOEI, 2011c) states that formative assessment should be conducted in every class. It should have the purpose of determining the learning progress of the students so that teachers can reflect upon their teaching practice and adjust it to focus on promoting students' achievement. The data collected from formative assessments should reflect the students' level of achievement as well as provide a guide for feedback related to the students' needs to help them improve their academic performance at the appropriate time.

#### **Performance-Based Assessment**

Teachers from different parts of the globe have been concerned about the actual applicability of summative assessments when it comes to deciding whether or not the results obtained from them reflect the students' true learning. This concern has encouraged teachers to search for alternative forms of assessment. As a result, performance-based assessment, which is a type of authentic assessment that focuses on student's potential- has gained a place in foreign language classrooms (O'Malley & Valdez Pierce, 1996). This type of assessment enhances students' performance by using challenging and meaningful in-class-activities which promote the connection of students' previous knowledge of a topic with new content information (Herrera & Morales & Murry, 2013; O'Malley & Valdez Pierce, 1996).

Some of the specifics related to performance-based tasks are the construction of responses within a task, the promotion of higher order thinking, authenticity within the tasks, integration of language and cognitive skills, the evaluation of the process applied to get a product, and the in-depth demonstration of students' content learning (O'Malley & Valdez Pierce, 1996). Herrera & Morales & Murry (2013) also highlight that performance-based assessment are grounded in constructivist processes and enhance the real performance of a task, contributing to students' discover knowledge by themselves and the scaffolding of their learning in a natural and continuous pattern. Students' performance of hands-on activities or the use of realia to do an activity is a common means to complete performance-based tasks (O'Malley & Valdez Pierce, 1996).

#### Performance-based tasks for assessing students' speaking skills.

Countless are the activities that teachers can adapt for promoting and assessing students' speaking skills individually and cooperatively. Ellen (2002) suggests a set of assessment tasks that can be adapted for this purpose. These activities include:

- Constructed response: open-ended statement with which learner is asked to agree (listing example to justify the answer) or disagree (explaining what an alternative answer is and why it was chosen)
- Cooperative-group work: group project only is assessed; contributions by individuals are assessed as well as the group's' result; bonus points are given when certain members or when all members achieve; or individual points are added to form a total group score.
- Demonstration: illustration of a procedure with the performance of necessary steps and explanation of results.
- Display: poster, photo, chart, graph, etc., about a project, accompanied by verbal explanations.
- Draw and tell test: picture or diagram drawn as a model to represent a concept [...]
- Problem-solving: staging of the hands-on problem to solve, accompanied by a verbal explanation. [...]
- Student conference/oral interview: discussion about activities, interests or experiences between students and teacher and/or other adults. [...]
- Exhibitions: ... real-world demonstrations not only of what students know but also of what they are able to do with their knowledge ...



- the student must exhibit the products of his learning...what may be required of students: demonstration, use of information, research skills, descriptive skills, communication skills, imaginative skills, verbal explanation, defense of work, convincing arguments, fielding of questions, explanations of how and why [...] (p. 80-83)
- Class presentation: select different tasks for class production. [...]
- Debate team: select, research, and present opposing viewpoints. [...]
- Group investigation: take on a specific role within a group and prepare projects, research or report to share with the class.
- Interviewing: form questions, interview someone, record answers and organize a report; paired interview [...]
- List of concerns: generate a personal list of concerns, questions, and ideas about a topic and share/compare with another learner. [...]
- Panel discussion: select a moderator and present a topic for the class; panel of experts: develop a set of questions and answers about a topic, they assume roles of moderator, quizzer, judge and recorder for their group [...]
- Personal picture: respond, with a personal solution to an open-ended problem by role-playing.
- Tell/retell: tell ideas to a partner, then tell another pair each other's idea, then join another four and retell only the ideas not previously told, ending with a group recap of all eight ideas. (p. 114-116)

Furthermore, Herrera (2010) also provides a handful set of hands-on activities and manipulatives that teachers can take advantage of to enhance and assess the students' written and spoken skills. Hands-on activities based on Herrera's Biography Driven Instruction method include:

Hearts Activity	Cultural Quilts
Word Walls	Dots Chart
Vocabulary Quilt	Linking Language
Multidimensional Square	U-C-ME
Mind Maps	Pic – Tac – Tell
Reflection wheel	IDEA

The activities proposed by Wlodkowski & Ginsberg (1995) as alternatives to tests can also be adapted to enhance and evaluate the speaking skills of English language learners. These alternatives involve:

Performing a movie script	Report current events as a news show
Developing a music video []	Developing an audiotape []
Explaining an advertisement []	Inventing song lyrics []
Performing a play script []	Directing a videotape

The activities suggested here can provide teachers with a canvas of opportunities to promote and assess the development of language learners' oral skills. First, teachers can encourage students to work cooperatively or individually on performing the tasks in a written form so that they can have some time for preparation and then motivating them to produce the outcome orally.



#### Performance-based tasks in practice

In this section, we provide examples of performance-based tasks in practice. These tasks were developed with A1 proficiency level students enrolled in a government-funded university in Ecuador. The learners of the examples were taking level-one ESP classes, according to their majors - Business Management and Hotel and Tourism. The main purpose of their ESP courses is the development of learners' speaking skills. Therefore, throughout the course, students worked in a variety of performance-based tasks that allowed the accomplishment of this aim in an authentic way. Even though the performance-based tasks described in the next paragraphs were developed with ESP students, they could certainly be developed individual taking regular EFL classes (we should keep in mind that the learners of these examples held an A1 proficiency level of English).

#### **Role-plays**



Role-play is a communicative activity in which students apply vocabulary and expressions related to a specific field in a real-life context. On the picture above, we see an example of a role-play developed by students from the career of Hotel and Tourism in a public university. In this activity, learners are practicing how to order, take orders, and serve food in the target language. Before participating in the dialogues, they familiarized themselves with words and expressions related to the restaurant context by reading a passage, doing some vocabulary exercises, listening to a dialogue or watching a video, and writing. While role-playing, the teacher observes and evaluates their performance with a rubric. At the end of the activity, students receive feedback. The feedback promotes the improvement of students' oral production each time they participate in this activity.



In this other picture, we can see a group of students performing a Business Talk Show. The core concept of the Talk Show was associated with the content students had learned in one curricular unit - Customer Care. Students were expected to show what they had grasped along the unit (key vocabulary and key concepts), enabling their teacher to assess not only how much the students had learned in four weeks but their speaking skills as well. The assessment of students' content knowledge and speaking skills by means of this performance-based task provides a clear example of a summative evaluation in which the teacher did not resort to traditional paper-and-pencil tests.

#### Group investigations



In these two pictures, we observe the outcome of a group investigation. The performance-based task presented here was the end-of-semester task assigned to students majoring in Business Management. The task consisted in students' creation of a digital newspaper with eight news. The news was based on the results reported in scientific articles about Human Resources. Students selected the papers themselves, allowing freedom of choice. They recreated the scenario of the news considering key points such as the people who were part of the investigation, place, year, data collection methods, results, and other aspects contemplated by the students. Their products were then reported to the class.

#### Interviewing



In this case, we have two scenes of English language learners participating in interviews. In the first picture, the students are performing a job interview. This scene did not require any other resources but the students themselves. One of the students pretended to be the human resources manager of a company and the other one the applicant for a job position. The students asked and answered questions to each other, completing the task successfully. In the second picture, we see a more elaborated scene. Students showed their creativity by producing a piece of news report interview in which the interviewee answered questions about employment laws.



#### Oral presentations



Oral presentations provide teachers with a canvas of opportunities to promote and assess their students' speaking skills. In the first picture, a student performed an oral presentation in which she explained the situation presented in a video. The student had to do her presentation based on what they saw in the video, even though she did not understand much of it because of her English proficiency level. What was important here was how she managed to explain what she saw throughout the video. In the second picture, the student is performing an oral presentation about safety equipment. She described and talked about the importance of each safety equipment piece seen in the picture.

#### Video-based oral presentations



Technology open doors to the development and assessment of students' speaking skills out of the classroom walls. The production of video-based oral presentations such as the weekly video log presented here is one example of it. In this performance-based task, the student recorded herself explaining the content learned in the previous week classes. In the weekly video log, the student defined key concepts, key vocabulary, and illustrated them with examples or the description of pictures associated with them. Students developed one video-based oral presentation per week, allowing the ongoing evaluation of students' language knowledge and speaking skills.

In all the activities presented in this section, the oral production of students was assessed by using either a rubric or a checklist.



#### CONCLUSIONS

Getting EFL learners utter or write their first words in English is gratifying but hearing them expressing their thoughts about a topic more fluently is definitely rewarding, especially when one achieves this with students whose biggest source for English immersion and practice is their classroom environment. This work intended to give EFL teachers an opportunity to review different strategies to achieve and assess oral production in their students. Learning how performance-based tasks can help them to assess and promote their students' oral skills in an authentic and meaningful form will help EFL teachers to improve their teaching practice, therefore, benefiting their students day to day.

Performance-based tasks assist EFL teachers to meet their students' needs as they apply their knowledge working on authentic tasks and consequently demonstrate their progress. In addition, applying performance-based tasks, as a form of assessment give EFL teachers the opportunity to engage their students in cooperative activities so that they can feel more confident and motivated when being assessed in this language. Most performance-based tasks as collaborative in nature. Finally, by completing activities aimed at language usage in real life situations as well as activities adaptable to their sociocultural context, this type of assessment enables EFL teachers to challenge their students to use the language skills they have acquired throughout the teaching-learning process while at the same time evaluate their students creatively.

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# Predicting Sexual Satisfaction Based on Marital Conflicts, Attachment Styles, and Cognitive Schemas in Women Victims of Spousal Abuse in Savojbolagh- Iran

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#### ABSTRACT

satisfaction with marital relationships is one of the most underlying parts of a common life that can be affected by various factors; in this regard, this study was conducted to examine role of marital conflicts, attachment styles and maladaptive schemas in Sexual Satisfaction in Women Victims of Spousal Abuse in Savojbolagh- Iran.

this is a descriptive-correlational study and its statistical population consisted of all women referring to healthcare centers in Savojbolagh during February 2017-May 2017. 100 women victims of domestic violence screened and selected using Spouse Abuse Questionnaire then they filled out Sexual Satisfaction Questionnaire, Marital Conflict Questionnaire, Collins and Reid Adult Attachment Scale, and Schema Questionnaire. The obtained were analyzed through SPSS Software using multiple regression method.

results of stepwise multiple regression analysis showed that variable of marital conflict could predict 34.4% of sexual dissatisfaction in studied sample (P>0.05); whereas, two variables of attachment styles and cognitive schemas could not predict sexual dissatisfaction (P<0.05).

marital conflicts play a vital role in predicting sexual dissatisfaction; hence, specialists and therapists should consider this variable when treating sexual problems and teach conflict resolution methods to couples.

#### **INTRODUCTION**

Spouse abuse is an aspect of domestic violence that occurs in privacy of family among persons who are in relation because of intimacy or legal and blood connection. This kind of violence is usually committed by men against women (Aghakhani et al., 2000).

The conducted studies show that 28% of women in developed countries have been abused by their husbands at least once during their marriage; the mentioned rate is about 18-67% in developing countries (Ahmadi & Nasery & Shams, 2008). This rate obtained to 65% in Iran during 2008 (Dolatian et al., 2010).

Spouse abuse may affect various aspects of life leading to psychological disorders such as anxiety and depression (Ghahari et al., 2009 & 2017), reduced self-confidence in women, low self-esteem, high anxiety, marital conflicts, and sexual dissatisfaction among women victims of spouse abuse (Raisi, 2010).

Marital conflict is a negative and harmful element to families so that the interactions between spouses will be reduced when they find their conflicts unsolvable (Gottman, 2014).

Lambert & Engh & Hasbun & Holzer (2012) concluded that high levels of marital conflicts are related to sexual dissatisfaction. Lack of healthy sexual relationship between spouses causes leads to increased conflicts as well as communicational-behavioral problems between spouses.

According to conducted studies, some other factors such as psychiatric disorders (Dosch et al., 2016), lack of suitable relationship with spouse (Oleary & Heyman, 2005, and organic, cultural, psychological factors lead to sexual dissatisfaction.

In this regard, Epstein and Baucom introduced schemas as a kind of cognitions that are significant in marital relationships (2005).

Yung et al. (2005) defined early maladaptive schemas as self-harming emotional and cognitive patterns formed in kind at the beginning of growth then repeated in sexual relationships that can effect on experiences and relationships. Such schemas in persons with complicated personality may cause more risks such as emotional disorders or other kinds of psychological disorders (Yung et al., 2003).

Findings imply that specific cognitive schemas can effect on sexual satisfaction of persons (Khosravi & attari& Rezaei, 2011). There is a relationship between sexual satisfaction in women and 4 schemas including emotional deprivation, distrust, rejection and abandonment, and failure and shame (Manzary, Mackvandi&khajevand,2014).

Attachment styles are other effective psychological factors in sexual dissatisfaction. Results obtained from various studies indicate that anxiety and avoidance attachment styles are in relation with low sexual satisfaction considering sexual and emotional dimensions (Camilla & Qverp & Smith, 2017). There is a relation between these attachment styles and watching pornography films (Gouvernet et al., 2016) and risky sexual actions (Trub & Stark).

According to the results obtained from study of Margolis (2003), 40% of women have experienced sexual dissatisfaction during their marital life. Iranian experts believe that 50-60% of divorces are because of sexual disorders and problems (Forootan, 2007).


Accordingly, this study was conducted to examine the role of attachment style, cognitive schemas, and marital conflicts in predicting sexual satisfaction of women victims of spouse abuse in Tehran, Iran regarding importance of sexual satisfaction and its effects on family and limited studies conducted in this case.

## METHODOLOGY

This is a descriptive-correlational study that its statistical population consisted of all women referring to healthcare centers in Savojbolagh from February 2017 to May 2017. 100 women victims of domestic violence were screened and selected using spouse abuse questionnaire.

It should be mentioned that the goal of study was explained to all of participants and they were free to choose participate in study or not. Moreover, it was announced that private information and names of participants are confidential and obtained data are analyzed in categories.

All sample members filled out Sexual Satisfaction Questionnaire, Marital Conflict Questionnaire, Collins and Reid Adult Attachment Scale, and Schema Questionnaire. The obtained were analyzed through SPSS Software using multiple regression method.

#### **INSTRUMENTS**

Data collection instruments in this study consisted of demographic questionnaire, Spouse Abuse Questionnaire of Ghaharri et al. (2005), Marital Conflict Questionnaire, Reid and Collins' Adult Attachment Scale, Inventory of Sexual Satisfaction, and 90-item Yung's Early Maladaptive Schemas Questionnaire.

**Demographic Questionnaire:** this questionnaire consists of 15 items including age, background, spouse's job, marriage duration, education level of spouses, number of children, etc.

**Ghahari Spousal Abuse Questionnaire** : this questionnaire consists of 44 items and three components of physical abuse, emotional abuse, and sexual abuse. Physical abuse such as beating and any kind of physical harm; emotional abuse such as humiliation, not meeting economic and mental meets, mocking and any kind of disruptive behaviors; sexual abuse such as any action that is uncommon within a sexual relationship such as violent sex or forced sexual relationship. Internal validity and reliability of this questionnaire obtained to 0.92 and 0.98, respectively (Ghahari et al, 2008, Ghahari et al, 2009).

**Marital Conflict Questionnaire:** this is a 42-itemms instrument to measure marital conflict based on experiences (Saadoddin, 2008). This questionnaire evaluates 7 dimensions of marital conflicts including reduced collaboration, reduced sexual relationship, increased emotional reaction, increased demand for children's support, increased personal relationship with relatives, reduced family relations with relatives and friends of spouse, and separating form each other financially. Each item is scored based on a 5-point Likert scale so that higher score is equal to higher conflict and reverse. Reliability of this questionnaire obtained to 0.94 using Cronbach's alpha in a study conducted by Afkhami, Bahrami, and Fatehizadeh (2007).

**Reid and Collins' Adult Attachment Scale (RAAS):** this scale was designed by Collins and Reid (1990). This questionnaire consists of 3 components and 18 items that are scored based on 5-point scale. Components include secure attachment style, avoidance attachment style, and anxiety attachment style; Cronbach's alpha coefficient obtained to 0.81, 0.78, and 0.85 forsecureattachment style, avoidance attachment style, and anxiety attachment style, and anxiety attachment style, respectively and reliability coefficient reported to 0.95 (Wu, Zhang, Liu, 2004). Khojasteh et al (2014) conducted a study in which, Cronbach's alpha of anxiety and avoidance attachment styles obtained to 0.70 and 0.52, respectively; its simultaneous validity coefficient (divergent) withSimpson Secure Attachment Scale obtained to (P 0.061)-0.20 and (P 0.104)-0.51, respectively.

**Inventory of Sexual Satisfaction (ISS):** this inventory was designed by Hadson et al. (1981) to evaluate satisfaction levels of spouses consisting of 25 items. Responses are scored based on 5-point scale so that minimum and maximum scores obtained to 25 and 125, respectively. High score in this scale indicates sexual satisfaction. Reliability coefficient of Cronbach's alpha and retest (within one week) reported to 0.91 and 0.93, respectively (Nomejko & Dolinska-Zygmunt, 2014). This scale has an appropriate differential validity in determining couples with and without sexual problems and content validity of this scale with subscale of Enrich's sexual satisfaction scale obtained to 0.74. Cronbach's alpha coefficient of this scale obtained to 0.94 and its reliability reported to 0.85 using split-half method (Teimourpoor, 2010).

**Early Maladaptive Schema Questionnaire:** self-report questionnaire of early maladaptive schema consists of 90 items and 18 scopes of early maladaptive schemas including Emotional deprivation, Abandonment/ Instability,Mistrust/mistreatment, Social isolation/ alienation, Defectiveness/ unloved, Failure to achieve, Dependence/ practical incompetency, Vulnerability to harm and illness, hardship, obedience, sacrifice, emotional inhibition, unrelenting standards, entitlement/ grandiosity, insufficient self-control/ self-discipline, approval-seeking, negativity/ pessimism, punitiveness. Each scale consists of 5 items that measure early maladaptive schemas, Yung, Norman, Schi, and Thomas (1995) reported validity of this questionnaire to 0.95 and 0.81 using internal consistency and retest methods.

This version was standardized in Iran by Yoosefi, Etemadi, Bahrami et al. (1999). Confirmatory Factor Analysis of differential self-inventory (DSI-2) indicated high validity of this instrument.

## RESULTS

Demographic data of women victims of spouse abuse are described in table1. 100 women victims of spouse abuse participated in this study. Results of study indicated prevalence (89%) of illiteracy among women victims of spouse abuse and 92% among their husbands. Job status of women victims of spouse abuse was examined within 4 categories of unemployed, worker, employee, and other jobs. The obtained results showed that majority of these women (65%) and their husbands (49%) were workers, 22% of these women and 14% of their husbands were unemployed (without income).

Mean and standard deviation of variables showed that mean score (83.27) of sexual satisfaction of participants has an indirect relation with early maladaptive schema (298.73) while mean score (60.56) of secure attachment style has a direct relation with sexual satisfaction.

		N	frequency	frequency
				percent
education	below diploma	100	45	45
	BA and above		44	44
			11	11
job	unemployed	100	22	22
	employee		65	65
	others		8	8
			5	5
spouse's	below diploma	100	68	68
education	$\mathbf{B}\mathbf{A}$ and above		24	24
	DA and above		8	8
Spouse's job	unemployed	100	14	14

Table 1.	Demographic	information of	of women	victims o	f spouse abuse	(frequenc	v and free	uency r	percent	;)
	· · · · · · · ·					· · · · · ·			£	/



worker	49	49
employee others	12	12
	26	26

	Ν	Mean	Std. Deviation
Marital conflicts	100	143/89	28/803
Sexual satisfaction	100	83,27	15/857
Attachment style	100	60/56	12/159
Early maladaptive schema	100	298/73	68/121

#### Table 2. Mean and SD of research variables

To examine correlation rate between research variables, Pearson Correlation Coefficient was used and since this coefficient should be below 0.7, results described in table 3 indicates correlation between studied variables at level of P<0.05.

Results obtained from ANOVA and statistical values of regression between mean of criterion variable (sexual satisfaction) and predictor variables showed that the calculated F value (96.3) -18.3 is significant for variable of marital conflict (P<0.001) and this variable can explain 0.35 of variance changes related to sexual satisfaction ( $r^2$ =0.35).

Results of stepwise regression analysis indicated that variable of marital conflict that is a predictor variable is capable of predicting sexual satisfaction that is criterion variable while other variables had no sufficient predicting ability and excluded from regression equation. The results described in table 5 imply that one unit increase in score of marital conflictleads to 0.635 decline in sexual satisfaction; hence, it is a robust predictor. Therefore, it can be stated that marital conflict can predict (P>0.05) sexual dissatisfaction in studied population while two variables of attachment style and cognitive schemas cannot predict sexual dissatisfaction.

	Table 3. Correlation matrix of variables													
4	3	2	1	Variable										
			1	Sexual satisfaction										
		1	-0/597**	Marital conflicts										
	1	0/562**	-0/335**	Early maladaptive schema										
1	0/519**	0/531**	-0/249	Attachment										

#### Table 4. Summary of regression model between sexual satisfaction, marital conflicts, attachment, and schema

SD error	R2Adjusted	R2	R	Model
12/781	/3500	/3570	/5970	1
12/847	/3440	/3570	/5970	2
12/842	/3440	/3640	/6030	3

Sig		Standard		Non- standardized	Predictor variable	Model
	t	Beta	Standard	В		
			error			
0/001	19/95		6/54	130/59	Fixed value	
0/001	-7/37	-0/597	0/045	-0/329	Marital conflicts	1
0/001	18/59		7/023	13/57	Fixed value	2
0/001	-6/076	-0/598	0/054	-0/329	Marital conflict	
0/991	./012	0/001	0/023	0/001	Schema	
0/001	16/77		7/603	127/54	Fixed value	3
0/001	-6/06	-0/635	0/058	-0/35	Marital conflicts	
0/754	-0/315	-0/033	0/024	-0/008	Schema	
0/303	1/036	0/105	0/132	0/137	Attachment	

## Table 5. ANOVA of significance of the whole regression model of sexual satisfaction, marital conflicts, attachment, and schema

## DISCUSSION AND CONCLUSION

Results of this study showed a negative and significant correlation between marital conflict and sexual satisfaction in women victims of spouse abuse; accordingly, among predictor variables (marital conflict, attachment style, and early maladaptive schemas), marital conflict is the only viable that can predict criterion variable of sexual dissatisfaction in women victims of spouse abuse. Moreover, regression analysis clarified the fact that marital conflict is the stronger predictor variable in relation with sexual satisfaction among women victims of spouse abuse compared to other variables. This finding is in line with results obtained byShakerian et al. (2014, Gano, 2001, Modanlou, Ziaee, and Rabiee (2005), Movahed and Azizi (2011). The mentioned result can be explained in this way that dissatisfaction with marital life in marriage may inhibit or surpass sexual feelings making individuals deal with sexual issues using avoidance methods ( Teimourpoor, 2010) Unmet sexual needs are the most significant factors in marital conflicts (Hayes et al., 2008). Lack of attention to sexual needs leads to weak marital relationships between couples (Salarifar, 2006) then increased conflicts between them causes sexual satisfaction (Tadayoan & Ahamadi, 2015).

Such dissatisfaction may lead to troubles in relationships between couples, hatred, annoyance, jealousy, competition, sense of revenge, feelings of humiliation, lack of self-confidence, etc. these issues may be worsen due to tensions and conflicts in marital relationships deepening the gap between couples (Christofer & Sprecher, 2000) so that it may lead to marital dissatisfaction and other problems in marriage and family (Shamloo, 2008).

The reverse case can be defined in which, lack of sexual satisfaction leads to marital conflicts. Results obtained in study conducted by Saadodin (2008) introduce lack of sexual satisfaction of couples as one of main factors for marital conflicts (Asgari, 2001). High-level sexual satisfaction increases quality of marital life and reduces communicational problems between couples; this issue also can reduce instability of marital life and divorce rate. According to the results of this study, variables of attachment style and maladaptive schemas cannot predict sexual dissatisfaction in studied sample. This result is not matched with findings obtained by Kamila et al. (2017), Khosravi et al. (2011), and Manzari et al. (2014); they found that attachment style and early maladaptive schemas can predict sexual satisfaction regarding emotional and physical dimensions (Gouvernet et al., 2016). They also indicated that emotional deprivation, mistrust, abandonment and alienation, defectiveness and shame are related to sexual satisfaction in women and those couples who have maladaptive schemas experience more conflicts and may separate from each other most likely but these schemas may affect sexual satisfaction of person reducing problem solving ability and exposing person to conflicting situations.

Acknowledgement: We appreciate all of staffs working in healthcare centers in Savojbolagh and women referring to these centers that collaborated with us filling the questionnaires out.



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Preparing an Instructional Design Based on Science, Technology, Engineering and Mathematics (Stem) Approach on the Topic of "Chemistry Everywhere" for 10th Grade Students

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## ABSTRACT

This paper is a report of the study whose purpose is to prepare an instructional design for "Chemistry at Home" subjects in the "Chemistry Everywhere" unit of 10th grade students, based on STEM approach and compare the effects of the implementation of the prepared material on students' academic success and creativity with students who are educated with the traditional education approach. A test developed by the researcher which consists of 32 questions whose validity and reliability tests have been carried out will be given as pre and post test.

The study was carried out with 32 students, 15 in the study group, 17 in the control group. The students in the study group were steered towards STEM education in their classes and it was made possible for the students to use the existing knowledge in a manner to develop their creativity and problem solving skills rather than acquiring it passively. They were given help in terms of team work in the laboratory, participating in extracurricular activities and developing their self-esteem. The classes of the students in the control group were continued to be made in accordance with the traditional education approach, the experiments in their textbooks were carried out with the instructions of the teacher. In the tests in which measured the academic success and creativity of the students in the study group, it was determined that these students were more successful and the obtained data was statistically more significant.

## **INTRODUCTION**

The increase in the competition between countries in economic, scientific and technological fields has caused the search for the understanding of quality education to increase. The main purpose of education is to raise qualified individuals and to realize an innovative instructional design based on the principles of science teaching. Keeping pace with the rapid changes taking place in science and technology is very important for the advancement of the countries. The United States being the foremost among other improved countries rapidly continue investing in engineering and innovation (Akgündüz et. al, 2015) It has been thought that science and engineering education need to start to be implemented in primary and secondary education institutions and that engineering will create a good environment for the applications of mathematics, science, and technology, thus the applications of Science, Technology, Engineering and Mathematics (STEM-FeTeMM) have begun to develop rapidly and become widespread. In Turkey, FeTeMM which the abbreviation of science, technology, engineering, and mathematics is used for STEM (Çorlu, 2014).



Increasing unemployment and global economic problems have led the 21st century's focus to innovation. Developed countries, mainly the US, invest in innovation with the purpose of encouraging economic growth. The growth of innovation requires having knowledge in the fields of science, technology, engineering, and mathematics and it requires improvement in these disciplines. This is why there is innovative STEM labor competition between countries (Çorlu, 2014).

The skills of STEM are defined as multi-disciplinary process-product that transcend disciplines. Today, STEM education is very significant. The purpose of STEM is to raise innovative, searcher, and creative generations with inquiring mentalities. In our country as well, there are studies conducted in order to integrate the current curriculum to STEM education and for it to be applicable and the reflection of this can be seen in the new effectuated curriculums (MEB High School Chemistry Teaching Program, 2017). When the subjects in the curriculum are associated with real life, the meaningful learning of students will take place (Çorlu, 2014).

STEM education which is considered as one of the biggest educational movements of the late years is a multidisciplinary approach aimed at training students to integrate their disciplines in science, technology, engineering, and mathematics. In this approach, the four disciplines are not taught separately and with different subjects, but instead, together and at the same time in the real life situations.

The implementation rate of STEM education in the schools in Turkey is pretty low. However, in the last years, with the increase of the importance of STEM, it has started to become widespread. Only a small percentage of students studying at specific private schools encounter STEM applications at international standards. The students in these schools have placed our country in the top 10 ranking in international Mathematics and Physics Olympiad competitions. However, the randomly chosen Turkish students are under the 60% slice in mathematics and physics classes in the international ranking. When the performances of private schools and public schools are examined separately, it is seen that there is a significant difference in the results of private school students in Turkey do not receive quality STEM education. While it becomes more and more important each day that economy is knowledge based, the countries need STEM educated teachers who adopt the innovative approach. This way, teachers who are equipped with the knowledge and skills will teach innovative students in STEM fields (Akgündüz et al., 2015).

It is seen extremely important to raise expert individuals in science, technology, engineering, and mathematics disciplines who will play a part as human labor for a country to overpower in the scientific and economic fields and continue to overpower and to support STEM education. Accordingly, in the last years, in the field of science and education, there has been a rapid advancement period in the organization of programs based on STEM education. Murphy and Mancini- Samuelsen (2012) stated that this education is mainly aimed at high school students but in the recent years, it has started to focus on secondary school students as well.

The after school activities in STEM education has an important place. Individuals participating in after-school activities can produce solutions to problems presented in a simple context in their daily life. At first glance, after-school programs are associated with visits to places such as science clubs, museums, zoos, planetarium, and natural parks. Apart from these, after-school programs also involve robotics, science project exhibitions, science and mathematics Olympiads. While the after-school activities contribute to students getting higher success in sciences, it also motivates them to work together, share their ideas, experiences, and knowledge with each other (Şahin, Ayar and Adıgüzel, 2014).

The skills of the 21st century, together with constantly developing science and technology, are accepted as creativity, critical thinking, collaborative work and problem-solving. In our country, it is foreseen that process of education in primary, middle and secondary school will be renewed and improved based on these skills. In Turkey, the interdisciplinary practices can be added to the current curriculum and STEM education can be integrated with a solution based approach to the problems of life which also does not limit the education to the class hours and the school environment. In such practices, students must be given the same quality education without taking into account any exam success, socioeconomic status or gender.



In summary; STEM education, which aims to have the individuals look at problems from a multidisciplinary point of view, to have them gain knowledge and skills, which prepares the students to get ready for the developments of 21st century and have them gain the 21st century skills is important in the sense that it gives opportunities to students from all levels to become experts in the fields of Science, Technology, Engineering and Mathematics (Meyrick, 2011). It is thought that the students who have an interest in STEM disciplines being supported is possible with the regulation of the programs underlined with this approach (Ceylan, 2014).

STEM education can be defined as 'Science, technology, engineering and math education programs that are aimed to be supported and strengthened with priority, from middle school to secondary school to university including the adulthood period'. The renewed high school Chemistry curriculum has aims suitable to the implementation of STEM education and constructivist approach. With directing students to this education, it is aimed that the students are educated in the direction of improving their creativity and problem-solving skills instead of having them receive the information passively. It is also aimed to improve students' self-management and self-confidence through teamwork practices. STEM education will also help students make better decisions in choosing a profession in university as it will help them recognize their abilities and skills.

It is aimed to have all the students from all levels to look at problems with a multidisciplinary point of view, earn them knowledge and skill, get them prepared for 21st-century developments and earn them 21st-century skills. The purpose of this study is to analyze the 'Chemistry at Home' subjects that appear in the unit 'Chemistry Everywhere' in the 10th-grade Chemistry class, to see the effects of the implementation of the instructional design that is based on Science, Technology, Engineering and Mathematics (STEM) on the academic achievement of students, creativity and problem-solving skills, to analyze the same topic with the comparison between education implementations based on the current Sciences education programs and the implementations of the supported constructivist approach and to receive opinions of the students on the topic of STEM education.

## THE STUDY

In this study, the effect of the instructional design developed on the basis of STEM education on the cognitive skills of the student has been investigated as well as its effect on skills such as researcher, collaborative work, technological literacy and, social communication. There has been looked for an answer to the question: "Is there an effect of the instructional design based on Science, Technology, Engineering and Mathematics (STEM) Education of 'Chemistry at Home' subjects that appear in the unit 'Chemistry Everywhere' in the 10th-grade Chemistry class on the academic achievement of the students and the improvement of the 21st century skills?" In addition to this, it has been analyzed if there is a statistically significant difference before and after the study between the academic achievement of the students in the experimental group and the academic achievement, creativity, and problem-solving skills of the control group students who were applied the constructivist approach supported by the teaching practices based on the existing Chemistry curriculum. There have been included the findings on the classroom observations of the students in the experimental group, their studies and their assignments that is named as out school activities and at the end of the study, the opinions on the STEM

34 students who receive education in a private science high school in Istanbul in 10th grade in the 2nd semester of 2016-2017 academic year, have attended to the study. 13 of these students have been in the experimental groups. The remaining 21 students have constituted the control group. Even though high school education is planned according to the constructivist approach supported by teaching practices based on the current Chemistry curriculum, teaching students who aim to be successful in the university entrance exams remains to be more traditional. This situation causes the students to increase creative ideas by combining sciences and engineering. 10th grade, second-semester Chemistry units have suitable subjects for students to perform applications by using science, technology, engineering, and mathematics (STEM) together and create projects.

In the applications and improvement of the instructional design system prepared for 'Chemistry at Home' subject, the steps of Analysis, Design, Development, Implementation, and Evaluation which are in the ADDIE instructional design model are taken as the basis.



In the analysis step, the student characteristics and materials to be used are determined. While determining the subject outcomes, the outcomes of STEM are added to 10th-grade Chemistry Everywhere units designed by MEB (The Ministry of National Education in Turkey).

- For the technology discipline, there are examples given about the technological advances and implementations of medicines, cleaning products, cosmetic products, convenience food and polymers that are in Chemistry at Home subject.
- > For the mathematics discipline, there are the interpretations of the tables and graphs developed in the interpretation of the projects and researches developed by the students.
- For the engineering discipline, they are asked to create research projects for the products that can be developed alternatively to the cosmetic products.

In order to determine the materials to be used in the instructional design, MEB 10th-grade Chemistry book is grounded on. In addition to this, for preparedness, initial test, and final rest practices, the reference books allowed by MEB are benefited from. In the design of the experiments, while giving priority to the experiences in the MEB 10th-grade Chemistry class experiences, practices from the book called SAILS Inquiry and Assessment Units are also used.

In the instructional design developed on the basis of STEM education, the disciplines of science, technology, engineering, and mathematics are united with the 5E learning model of constructivist approach. The subject contents for these disciplines have been determined.

- According to science discipline; medicines, cleaning products, cosmetic products, convenience food, and polymers, as well as their daily use and experimentation are taught together.
- According to technology discipline; videos, animations or simulations about these subjects in the internet that MEB approves are used.
- Tseng et al. (2011) carried out a study about the effect of project based education on STEM education. In this direction, according to the engineering discipline, they are asked to develop alternative project ideas to the cosmetics with the aim of find solutions to the problems students face in their daily lives.
- According to the discipline of mathematics, on the project ideas the student will develop and the researchers the student will realize, the graphic and table creation and interpretations are urged on.

The developed instructional design has been applied in the classroom and science laboratory for 3 weeks, 9 hours.

## FINDINGS

The study is carried out with the subject 'Chemistry at Home' from the 'Chemistry Everywhere' unit. At the beginning of the subject, a measuring tool with 32 questions composed of true- false, filling the blanks, open ended questions and test questions to be able to test the preparedness of students and compare the pre test and the post test was used. According to the test analysis method prepared by the assessment and evaluation department of the high school, the following results were obtained for the experiment and control group.



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Figure 2: Experimental Group Pre Test Success Analysis



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3		F.CEYDA CİHAN	10A	3	3	3	0	3	0	3	3	3	0	3	3	3	3	3	0	0	0	0	0	0	0	0	3	3	20		62	62
4		BAŞAK MARABA	10A	3	3	3	0	0	0	3	0	3	3	3	0	3	3	3	0	0	3	3	3	4	3	3	0	0	12		61	61
5	107	SENA SUNBUL	10A	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	0	0	3	3	12		76	76
6		EMİR ASAL	10A	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	0	0	24		88	88
7		MINA MUSTAFAZADE	10A	3	0	3	0	3	0	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	0	0	3	3	12		70	70
8	198	TEOMAN YILDIRIM	10A	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	3	0	8		75	75
9	-	SENA BAYRAM	10A	3	0	3	3	3	3	3	3	3	0	3	3	3	0	3	0	3	3	3	3	4	0	0	3	3	12		70	70
10		BEGÜM ZEYNEP ONUR	10A	3	0	3	3	3	3	3	3	3	0	3	3	3	0	3	0	3	3	3	3	4	0	0	3	3	12		70	70
11	188	TAHA YİĞİT ERDOĞAN	10A	3	3	3	3	0	3	3	0	3	3	3	0	3	3	3	0	0	0	0	0	0	0	0	3	3	16		58	58
12	182	CEREN TANKA	10A	3	3	3	0	3	3	3	3	3	0	3	3	3	0	3	0	3	3	3	3	4	3	3	3	3	20		84	84
13		AYÇA AYTEKIN	10A	3	0	3	0	3	3	3	3	3	0	3	0	3	3	3	0	0	3	3	3	4	3	3	3	3	16		74	74
14		Y.EMRE PULATOGLU	10A	3	0	3	0	0	0	3	3	3	0	3	0	3	3	3	0	0	3	3	3	4	3	3	0	3	16		65	65
15	2	NUH MEHMET IŞÇIMEN	10A	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	0	0	3	3	3	4	3	3	0	0	20		78	78
16		K.EREN OZBARUTÇU	10A	3	0	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	0	3	16		80	80
17		ZUBEYIR KAVURMACI	10A	3	3	3	3	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	16		89	89
18		DENIZ E.AYDIN	10A	3	3	3	0	3	0	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	0	3	20		84	84
19		ARDA ÇAKMAK	10A	3	0	3	3	3	3	3	3	3	0	3	3	3	0	3	0	3	3	3	3	4	0	0	3	0	8		63	63
20	191	BULUT OZEN	10A	3	3	3	0	3	3	3	0	3	0	3	0	3	3	3	0	3	3	0	3	4	3	3	3	3	16		74	74
21	74110	A. TARIK ATEŞ	10A	3	3	3	0	3	0	3	3	3	0	3	3	3	3	3	0	0	3	3	3	4	3	3	3	3	16	1	11	П

Figure 3: Control Group Pre Test Scores



Figure 4: Control Group Pre Test Success Analysis

Students were asked to develop their project ideas while working with the 'Chemistry at Home' subject with the experimental group. Thereby, it is aimed to create a work plan that can improve creativity, problem-solving, collaborative working skills. Two students from the school's Project Club have developed a project idea, taking advantage of what they have learned in the club. As a result of their research, they did a bacterial count by creating a project plan about using the powder of Sodium Bicarbonate alternative to cosmetics to reduce the odor of sweat. The students have determined the experimental method themselves. They accomplished each step of the experimental method they set out in the high school laboratory on their own. They created a table as the result of bacterial counting.







Fotograf 6

PARAMETRE	I. GÜN											
	I. ÖĞl	RENCİ	II. ÖĞ	RENCİ								
	A1	B1	A <sub>2</sub>	<b>B</b> <sub>2</sub>								
Toplam Heterotrofik Bakteri (koh/ öğrenci)	6500	11500	150000	210000								
Fecal Streptecocci (kob/öğrenci)	100	150	400	2500								
		п. (	JÜN									
Toplam Heterotrofik Bakteri (koh/ öğrenci)	4250	65000	52500	119000								
Fecal Streptecocci (kob/öğrenci)	250	1200	225	300								
Tablo 2												

(A= Sodyum Bikarbonatlı koltukaltı, B= Sodyum <u>Bikarbonatsıs</u> koltukaltı, <u>kob</u>= Koloni oluşturan birim)

Figure 5: Example from the Project of the Students

Students in the School Environment Club have prepared a survey about Genetically Modified Organisms (GMOs). By conducting their research in school, they determined the statistics of the knowledge about GMO foods of students, teachers, and staff, using the SPSS program on the computer. At the end of the survey, they created pie charts and column graphics.

#### The survey includes the following questions;

	Yes,I have heard.	Partially I have heard.	No,I have no idea.
Genetically modified(engineered) GMO or GEO: Have you ever heard about these kind of products?			

	Radio-TV	Newspaper- Internet	Local	Conference	Educational seminar
Where did you get the					
information about GMOs?					

	Yes	No
Would you like to learn about GMOs?		

Figure 6: Example questions of Survey about GMOs





Figure 7: Example graphics of survey about GMOs Figure 8: Example graphics of survey about GMOs

Laboratory experiments were one of the most important parts of the study. Experiments on the polymers used in everyday life were followed with interest from the point of view of the students. Instead of the classical experimentation guidelines, via benefiting from the book called SAILS Inquiry and Assessment Units, edited by Finlayson O. et al, suitable practices for STEM were developed.

On the other hand, with the control group students, the classes in accordance with the constructivist approach supported by the education applications based on the current Chemistry education program. Students in each group are tested at the end of the subject. The following results were obtained for the experiment and control group according to the scale including the same questions asked in the pre test.



ÖZEL EVYAP MÜRÜVVET FEN LİSESİ																																
D	RS :	KİMYA	ŞUBI	E:	10 <i>A</i>	٩	SIN	NIF M	EV.:	13	SIN	IAVA	GİR	en ö	Ğ <b>R</b> :	13	TAF	RİHİ :	2.	05. <b>2</b> 0	17	SIN	AV A	DI :	2.	DÖN	IEM			1.	YAZI	LI
* Sc	nuç bi	lgilerinin oluşması için Öğrenci No	ve Ad	lı So	yadı	bilgil	lerini	in eks	iksiz	girilr	mesi	gerei	mek	tedir.											2.DÖ	NEM	1.YA	ZILI				
	5	Sorularin konusu>		HAZIR GDALAR VE KAKTKI MADDELER	HAZIR GDALAR VE KAKTNI MADDELERÎ	TEMIZLIK MADDELERI	TEMIZLIK MADDELERI	TEMIZLIK MADDELERI	TEMIZLIK MADDELERI	TEMIZLIK MADDELERI	POLIMERLER	POLIMERLER	KOZMETİK MALZEMELER	KOZMETİK MALZEMELER	ilaçlar	ilaçlar	ilaçlar	KOZMETİK MALZEMELER	TEMIZLIK MADDELERI	HAZIR GIDALAR VE KAKTKI MADDELERİ	HAZIR GDALAR VE KAKTKI MADDELERI	HAZIR GOALAR VE KAKTKI MADDELER	POLIMERLER	POLIMERLER	POLIMERLER	ilaçlar	ilaçlar	KOZMETİK MALZEMELER	EVDE KİMYA GENEL		TOPI PU	LAM AN
	5	ORULARIN PUAN DEĞERİ>		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	24		100	100
SIRA	NO	ADI	SINIF	1. SORU	2. SORU	3. SORU	4. SORU	5. SORU	6. SORU	7.SORU	8. SORU	9. SORU	10. SORU	11. SORU	12. SORU	13. SORU	14. SORU	15. SORU	16. SORU	17. SORU	18. SORU	19. SORU	20. SORU	21. SORU	22. SORU	23. SORU	24. SORU	25. SORU	26.SORU	27.SORU	TOPL. PUAN	YUV.
1		HASAN BATUHAN ALTUNDAĞ	10F	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	3	0	20		87	87
2		FATMA ŞEYMA TAN	10F	3	3	3	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	24		97	97
3		SAMETCAN TURAN	10F	3	3	3	3	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	24		97	97
4		NISA OZEN AYDIN	10F	3	3	3	0	3	3	3	3	3	3	3	3	0	3	3	0	3	3	3	3	4	3	3	3	3	20		87	87
5		SERAY ÇELIK	10F	3	3	3	3	3	3	3	3	3	3	3	0	3	3	3	3	3	3	3	3	4	0	0	3	3	24	<u> </u>	91	91
6		CENGIZHAN BUYUKDAG	10F	3	3	3	0	3	0	3	3	3	3	0	3	3	3	3	3	3	3	3	3	4	0	0	3	0	24		82	82
-			10F	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	3	0	20	<u> </u>	87	87
-			10F	3	3	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	4	3	3	3	3	24		94	84
10			105	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	0	0	2	2	2	4	2	2	2	2	20	-	90	90
11		IPEM ALTUNTAS	10F	3	3	3	3	3	3	0	3	3	3	0	0	3	2	3	3	3	<u>с</u>	3	3	4	0	0	3	0	20		82	82
12			10F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	20	<u> </u>	96	96
13		FATIH SAID DURAN	10F	3	3	3	0	0	3	3	3	3	3	3	0	3	3	3	3	3	0	3	3	4	0	0	3	3	24	<u> </u>	82	82
14				Ť	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<u> </u>	-	-	<u> </u>		<u> </u>	<u> </u>		

Figure 9: Experimental Group Post Test Scores



Figure 10: Experimental Group Post Test Success Analysis

D	ER8 :	8: KIMYA ŞUBE: 10A SINIF MEV.: 21 SINAVA GIREN ÖĞR:			21	TAR	tiHi :	2	05.20	17	SIN/	AV AI	)I:	2.	DÖN	EM			1.	YAZIL	J.											
* So	nuç bilgi	ilerinin oluşması için Öğrenci No ve Adı So	yadı bil	gileri	nin ek	siksiz	giriln	nesi g	erekn	rekter	ár.														2.DÖ	NEM 1	.YAZI	u				
		SORULARIN KONUSU>		HAZR ODALAR VEKARDANDOBLERI	HAZR ODALAR VEKAMPANOOBLERI	TEMIZLIK MODELERI	TEMÍZLÍK MADDELERÍ	TEMÍZLÍK MADDELERÍ	TEMIZLIK MODELERI	TEMIZLÍK MADDELERÍ	POLIMERLER	POLIMERLER	KOZMETİK MALZEMELER	KOZMETÍK MALZEMELER	ILAÇLAR	ilaçıar	ILAÇLAR	KOZMETİK MALZEMELER	TEMIZLIK MODELERI	HAZRI GEDALAR VEKARDANOOBLERI	HAZR ODALAR VEKARDANODELERI	HADR ODALAR VERAMINADORLERI	POLIMERLER	POUMERLER	POLIMERLER	ilaçuar	ILAÇLAR	KOZMETİK MALZEMELER	EVDE KİMYA GENEL		TOP PU	LAM AN
		SORULARIN PUAN DEGERI>		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	24		100	100
SIRA	NO	ADI	SINIF	1. SORU	2. SORU	3. SORU	4. SORU	5. SORU	6. SORU	7. SORU	8. SORU	9. SORU	10. SORU	11. SORU	12. SORU	13. SORU	14. SORU	15. SORU	16. SORU	17. SORU	18. SORU	19. SORU	20. SORU	21. SORU	22. SORU	23. SORU	24. SORU	25. SORU	26. SORU	27. SORU	TOPL. PUAN	YUV.
1	118	ÇELİK EGE ERMAN	10A	3	3	3	3	3	3	3	3	3	3	3	0	3	3	3	3	3	3	3	3	4	0	0	3	3	12		79	79
2	127	S.EGE YILMAZ	10A	3	3	3	0	3	0	3	3	3	0	3	0	3	3	3	3	3	3	3	3	4	3	3	3	3	20		- 84 -	84
3		F.CEYDA CİHAN	10A	3	3	3	3	3	0	3	3	3	0	3	3	3	3	3	0	0	0	0	0	0	0	0	3	3	20		65	65
4		BAŞAK MARABA	10A	3	3	3	0	0	0	3	0	3	3	3	0	3	3	3	0	0	3	3	3	4	3	3	0	0	12		61	61
5	107	SENA SUNBUL	10A	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	0	0	3	3	12		82	82
6		EMİRASAL	10A	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	0	0	24		88	88
7		MINA MUSTAFAZADE	10A	3	0	3	3	3	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	0	0	3	3	12		76	76
8	198	TEOMAN YILDIRIM	10A	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	3	0	8		75	75
9		SENA BAYRAM	10A	3	0	3	3	3	3	3	3	3	0	3	3	3	0	3	0	3	3	3	3	4	0	0	3	3	12		70	70
10		BEGÜM ZEYNEP ONUR	10A	3	0	3	3	3	3	3	3	3	3	3	3	3	0	3	0	3	3	3	3	4	0	0	3	3	12		73	73
11	188	TAHA YIĞİT ERDOĞAN	10A	3	3	3	3	0	3	3	0	3	3	3	3	3	3	3	3	0	0	0	0	3	0	0	3	3	16		67	67
12	182	CEREN TANKA	10A	3	3	3	0	3	3	3	3	3	3	3	3	3	0	3	0	3	3	3	3	4	3	3	3	3	20		87	87
13		AYÇA AYTEKIN	10A	3	0	3	0	3	3	3	3	3	3	3	0	3	3	3	0	0	3	3	3	4	3	3	3	3	16		- 77	- 77
14		Y.EMRE PULATOGLU	10A	3	0	3	0	0	0	3	3	3	0	3	0	3	3	3	0	0	3	3	3	4	3	3	0	3	16		65	65
15		NUH MEHMET IŞÇIMEN	10A	3	3	3	0	3	3	3	3	3	0	3	3	3	3	3	0	0	3	3	3	4	3	3	0	0	20		78	78
16		K.EREN OZBARUTÇU	10A	3	0	3	0	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	0	3	16		80	80
17		ZÜBEYİR KAVURMACI	10A	3	3	3	3	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	16		89	89
18		DENIZ E.AYDIN	10A	3	3	3	0	3	0	3	3	3	0	3	3	3	3	3	3	3	3	3	3	4	3	3	0	3	20		84	84
19		ARDA ÇAKMAK	10A	3	0	3	3	3	3	3	3	3	3	3	3	3	0	3	0	3	3	3	3	4	0	0	3	0	8		66	66
20	191	BULUT ÖZEN	10A	3	3	3	0	3	3	3	0	3	0	3	0	3	3	3	0	3	3	0	3	4	3	3	3	3	16		74	74
21		A.TARIK ATEŞ	10A	3	3	3	0	3	0	3	3	3	3	3	3	3	3	3	0	0	3	3	3	4	3	3	3	3	16		80	80
22																																

Figure 11: Control Group Post Test Scores



Figure 12: Control Group Post Test Success Analysis

## CONCLUSIONS

When the questionnaire of students on their opinions on the STEM practices is looked at, it is observed that when the subject is on 'Chemistry at Home', the students attend the lesson with more interest. They have stated that they have observed that they can use what they learn in outside of school activities in their daily lives. When the post test cases of the experimental group and the control group are compared, it is possible to say that the number of incorrectly answered questions in the experimental group has decreased and in the control group, there is no significant change. It can be said that the subject of 'Chemistry at Home' being taught with STEM education can contribute very positively to the 21st-century skills of students. In order to improve the results of this study, there can be an analysis based on gender. There can be achieved a result by comparing the results of the performance value in the applications between the girl and boy students.



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## Preschool Teachers' Beliefs in Practices with 2-Year Old Children

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## ABSTRACT

Enrolment of 2-year old children in preschool has generated disputes among professionals and parents in the Czech Republic. This study tests two hypotheses: (1) Preschool teachers who teach 2 year old children have higher scores on pedagogical beliefs in the care area than on other areas. (2) These teachers have higher scores on pedagogical beliefs in the care area than those who teach children of ages 3-6. Two samples of teachers from the eastern part of the Czech Republic were recruited: those who teach 2-year old children and those who teach 3-6 year old children. A self-rate questionnaire was used to assess the level of beliefs. The data revealed that teachers in both samples have very high level of pedagogical beliefs. Those who teach 2-year old children believe that care is the strongest component in their practices in classes (hypothesis 1 supported), however, their scores on care does not prevail over teachers who teach 3-6 year old children (hypothesis 2 not supported). Teachers who teach 3-6 year old children significantly prevail over their colleagues who teach 2-year old children in self-help, autonomy, and cognitive learning.

## INTRODUCTION

Preschool attendance of children aged 3-6 has a long tradition in the Czech Republic. The preschool curriculum emphasises children's learning and development in cognitive, social, emotional and physical domains, which should be accomplished in a safe and healthy classroom environment. However, due to occupational needs of mothers it is recommended that preschools accept also children as young as 2 years – on condition that they are cognitively and emotionally mature to enter the preschool setting. This brought many issues, among them which teacher practices should be used in classes of this age group. This investigation examines preschool teacher's beliefs in care and educational practices with 2 year old children and compares them with beliefs of those preschool teachers who educate 3-6 years old children.

The key concept in this study is *teacher belief*. Teacher beliefs are convictions that dispose or guide teachers' thinking and action. They are implicit assumptions about their work, learning, children, curriculum, and even their roles as a teacher (Clark, 1988; Kagan, 1992; Pajares, 1992). There are a number of more elaborate definitions of teacher beliefs, which show different underlying aspects used by particular authors. Pajares (1992) claims that differences in definitions may be attributed to confusion between teacher beliefs and teacher pedagogical knowledge. The two are different concepts. Beliefs are more experience-based, while knowledge is more theory-based (Mansour, 2009). However, a teacher must have pedagogical knowledge – in addition to classroom experience – in order to generate professional beliefs. Without pedagogical knowledge a teacher would act in an amateur way and her classroom behaviour would be inefficient. Belief is situated, knowledge is more abstract. Beliefs are more evaluative and affective than knowledge. The relationship between teacher beliefs and teacher beliefs and teacher beliefs are more evaluative and affective than knowledge.

Another point of dispute is an implicit versus explicit quality of beliefs. On this point authors' opinions vary. If beliefs are implicit, they affect teacher practices in an uncontrolled way. This may be true because in many other situations people's actions are influenced unconsciously, or with low degree of awareness. However, more realistic position is that implicitness/explicitness varies according to the particular instructional situation. In some of them – e.g. if a teacher witnesses disruptive behaviour of the child – a teacher may activate consciously her beliefs, whereas in other situation she does not. Also, researchers argue whether beliefs are static or dynamic. Both views are supported by research evidence and have implications for research and practice. As Fives and Buehl (2012) describe in their review article, many researchers have described beliefs as relatively stable and resistant to change after some form of intervention (e.g., self-efficacy beliefs). Others have found that teachers' beliefs do change over time (e.g., beliefs about classroom practices, management, and children).

In this study we refer to teacher beliefs as *personal theories* of a teacher on teaching, learning, children, parents and the context of preschool. Teacher beliefs constitute a system (belief system) the elements of which are well integrated. Mansour (2009) describes it as an idiosyncratic unity of thought about objects, people, and events, and their characteristic relationships that affect teacher planning and interactive thoughts and decisions. Despite the widespread agreement that teachers beliefs exist in a system, few empirical investigations have examined beliefs as a complex entity (Fives & Buehl, 2012).

Many studies compared teacher self-rate belief data with observation of teacher practices to identify whether teacher behaviour is in accord with recommended teacher practices. These studies have demonstrated mixed results. Wilcox-Herzog (2002) found that in a group of preschool teachers there was no relationship between teacher beliefs and her actions. Vartuli (1999) and Stipek and Byler (1997), on the other hand, found that beliefs of preschool, kindergarten, and first grade teachers were consistent with the teacher practices. Kim (2011) found high agreement between these two variables in a group of teachers. Other studies concluded that teachers have better developmentally appropriate beliefs than they have developmentally inappropriate practices, i.e., they believe they teach better that they actually behave in the classroom (Charlesworth et al., 1991; Charlesworth et al., 1993; McMullen, 1999).

The differences between findings in studies may originate from several sources. Fang (1996) suggested that there may be inconsistencies between teachers' beliefs and practices due to the complexities of classroom life, which may constrain teachers' abilities to follow their beliefs and provide instruction that is aligned with their theoretical beliefs. Another source of mismatch may be attributed to self-rate belief questionnaires in which teachers tend to express professionally demanded responses rather than authentic responses. Teachers responded as they were expected rather than how they actually teach. They exaggerated some qualities in order to make a more favourable picture of themselves. Another explanation is that what they expressed in questionnaires is "conventional wisdom", i.e. generally accepted ideas and behaviours.

#### THE STUDY

This investigation compares beliefs in pedagogical practices of two groups of teachers: those who teach 2-year old children and those who teach children of 3-6 years. It was expected that the two groups differ in the degree of beliefs in childcare rather than in cognitive and social learning of children. The assumption behind this stance is that younger children need more care because of their vulnerability and lack of self-serve skills while the older children are more independent and can be taught more cognitive and social skills.

Two hypotheses were tested: (1) Preschool teachers who teach 2 year old children have significantly higher scores on the Care area than on other pedagogical areas. (2) Preschool teachers who teach 2 year old children have significantly higher scores on beliefs in the Care area than those who teach children of ages 3-6. *Methods* 

The Preschool Teacher Beliefs was developed in the following steps. First, the researchers theoretically derived five areas that they considered relevant for pedagogical practices in preschool. The areas are: 1) Care; 2) Cognitive development; 3) Social skills; 4) Self-help skills; and 5) Autonomy. Then they agreed on how to conceive the concept of teacher beliefs and how the items should be worded. By this manner a bank of sixty items was generated. In the next step, items that were duplicate or did not fit the professional beliefs were eliminated. 48 items that left were administered to teachers of the sample. The data were factor-analysed to check the structure and fit of the items with pedagogical areas. Principal components method of analysis was used with Varimax rotation and factor loading of .50 and higher. The best solution were three factors that accounted for 63 % of variance. The first factor *Activity* contained 11 items with Alpha of .930, the second factor *Communication with children* had five items with Alpha of .786 and the third factor *Dealing with parents* had

three items with Alpha of .656. The first factor was problematic. Though it had excellent reliability it contained a broad range of topics and, as such, it was unusable for a fine-grained assessment of teacher beliefs. Thus we resorted to an alternative option. We used the initial five pedagogical areas and performed item-total correlations. Items with sufficient correlation were retained, others were eliminated from the particular area. In this way we received pedagogical areas with good internal consistency. The description of pedagogical areas is as follows:

- 1. *Care* covers teacher's protection of health and safety of children, and emphasis on frequent physical activities outdoors. Four items have Alpha of .848.
- 2. *Cognitive development* covers facilitation of cognitive abilities, language, literacy and creativity. Eight items have Alpha of .756.
- 3. Social skills concentrates on facilitation of cooperation and peer communication. Five items have Aloha of .803.
- 4. Self-help skills concern skills and rules for eating, dressing, and use of toilet. For item have Alpha of .848.
- 5. *Autonomy* concentrates on facilitation of independence in behaviour and decision of the child. Five items have Alpha of .648.
- 6. *Communication with parents* creating possibilities for conversations with parents, getting information about the child from parents and informing parents about the progress of the child in learning and development. Five items have Alpha of .685. As this area does not concern teaching practice in a classroom, it will not be dealt with in this study.

Scale range was 1 (strongly disagree) -5 (strongly agree). The total number of items in the questionnaire is 31. Overall Alpha is .901.

### Sample

Two samples of teachers were recruited: those who teach 2-year old children (sample A) and those who teach 3-6 year old children (sample B). The two samples come from both rural and urban areas in the eastern part of the Czech Republic. The demographic characteristics of the samples are in Table 1. All subjects were female. **Table 1** Demographic composition of samples

		Sample A	Sample B
n		120 (41.1 %)	152 (55.9 %)
Highest qualification	Second. school degree	80.3 %	73.3 %
	Bachelor's degree	9.8 %	16 %
	Master's degree	9.8 %	10.7 %
Years of practice	М	20.6	20.4
	Range	1 - 41	1 - 40

## Findings

As Table 2 shows, the mean scores on all pedagogical areas of sample A teachers are relatively high; they all exceed the midpoint of the five-point scale used. This indicates that teachers are rather confident and self-assured about aims and components of the preschool programme. They do not consider preschool an institution that concentrates on care only, rather they assume its impact is on all-rounded development of children. This includes enhancement of a child's social development, self-care learning, and promotion of a child's autonomy. Arithmetic means decrease from the care area to the cognitive area, which indicates differing emphases on these dimensions of their practices. As expected, the cognitive area had the lowest mean score, differing from care by 1.13 points.

All differences between the scores on care and other pedagogical areas were statistically significant, thus supporting hypothesis 1 (Table 2). Teachers who teach 2-year old children believe that care is the strongest component in their pedagogical practices in classes. This is no surprise as young children require, first of all, intense care and only after this has been secured other teaching components come forward. Beliefs in physical skills development, especially gross motor coordination, were included in the care area as they are important part of most learning and play activities in preschool. Teachers believe that they must be responsive to children's needs, provide appropriate safety for learning and rest. They also believe children require secure relationship with the preschool staff to nurture the social and cognitive development and learning. They are confident in their role in supporting a child to be an autonomous individual, with particular wishes and desires.

Teaching areas	n	Μ	SD	Comparis	son with Care
Care	118	4.82	0.45	Z	Sig.
Social	110	4.48	0.53	-6.340	0.00**
Self-care	118	4.31	0.76	-6.728	0.00**
Autonomy	115	4.28	0.53	-7.736	0.00**
Cognitive	109	3.69	0.60	-8.650	0.00**

Table 2 Teachers beliefs in five pedagogical areas. Sample A

Sample A: teachers with 2-year old children. Scale used: 1 (strongly disagree) – 5 (strongly agree); Wilcoxon test, \*\* sign. < .01

In the second part of the investigation pedagogical beliefs of the two teacher samples were compared. Table 3 shows that mean scores of teachers in sample B express a trend identical with sample A. The highest mean score is on the care area, followed by the social and autonomy areas. The cognitive area scored the lowest. This indicates that pedagogical beliefs of teachers of both samples demonstrate an equal pattern. Teachers in both samples believe that pedagogical practices in the five areas, which were explored, are important in all age groups in preschool. Both samples believe in creating environment for an all-round education to all children in preschool. Social and cognitive skills as well as autonomy and self-help are not only essential classroom skills but they also transcend beyond the classroom walls.

We hypothesized that sample A teachers would prevail in the care area over sample B, that is, they will score higher on care, though not on other pedagogical areas. The findings did not support our assumptions. There was no statistically significant difference between the samples on the care area, thus hypothesis 2 was not supported. Statistically significant differences were found in pedagogical beliefs between sample A and B in three other areas, i.e., self-help, autonomy, and cognitive areas. The scores were in favour of sample B teachers. This can be explained by the fact that sample B teachers, who teach older children (3-6 years), put more emphasis on the development of these skills in children, which resulted in higher beliefs when compared with sample A teachers.

Pedagogical areas	Sample	n	Μ	SD	U	Sig.
Carro	А	116	4.82	0.45	7942 5	0.12
Care	В	148	4.89	0.26	/843.3	0.12
Sec. 1	А	110	4.48	0.53	(716.0	0.65
Social	В	141	4.61	0.38	0/10.0	0.05
Salf halm	А	118	4.31	0.76	6926 0	0.05*
Sen-neip	В	144	4.59	0.49	0820.0	0.03*
Autonomy	А	115	4.28	0.58	6000 5	0.00**
Autonomy	В	147	4.52	0.46	0222.3	0.00
Comitivo	А	109	3.69	0.60	1607 5	0.00**
Cognitive	В	144	4.11	0.46	4627.5	0.00

Table 3 Comparison of pedagogical beliefs between teacher samples

Sample A: teachers of 2-year old children; sample B: teachers of 3-6 year old children. Mann-Whitney U-test; \*\* sign. < .01; \* sign. < .05

Teacher beliefs have been characterised above as a kind of *personal theories* of a teacher that affects her practice in classrooms. They affect her planning of activities, interaction in classes and self-reflection on it. It is not quite clear how professional beliefs develop and which variables influence it. It is assumed that duration of teacher practice may be one of such variables because teachers generate their practical professional knowledge within rich situations in classrooms. To confirm this assumption we divided our samples into two groups, i.e., novice teachers (1-5 years of practice) and expert teachers (20-30 years of practice). Table 4 (merged samples A and B) shows that not only expert teachers but also novice teachers have very high scores on all pedagogical areas. However, statistically significant differences were only in care and autonomy areas, in favour of expert teachers. This again shows the dominant position of the care area in the system of teacher beliefs.

More experienced teachers consider this area more important than novice teachers. As concerns the autonomy area, it can be hypothesized that it is more difficult for less experienced teachers to concentrate on facilitation of independence in behaviour and decision of the child, which is the core of his pedagogical area.

	Novices		Experts		Differen	ce
	Μ	SD	Μ	SD	U	Sig.
Care	4.81	.29	4.95	.11	442.5	.012*
Social	4.47	.45	4.59	.42	456.5	.226
Self-help	4.43	.65	4.46	.66	563.5	.703
Autonomy	4.32	.53	4.58	.37	403.0	.029*
Cognitive	3.97	.58	3.96	.56	589.5	.952

Table 4 Pedagogical beliefs of novice and expert teachers

Mann-Whitney U-test; \* sign. < .05

### CONCLUSIONS

This study aimed at investigating pedagogical beliefs of preschool teachers who teach two groups of children, i.e., 2-year old and 3-6 year old children. In both groups relatively high scores were detected on the beliefs questionnaire, indicating that teachers have high confidence in the specific pedagogical practices in all five pedagogical areas investigated: care, social learning, self-help skills, autonomy and cognitive learning. In sample A, there were statistically significant differences between care area and other pedagogical areas indicating the dominant role of care of children in the preschool classroom. When samples A and B were compared, there were statistically significant differences in favour of sample B on self-help, autonomy, and cognitive areas. No statistically significant differences between the two samples on care and social areas indicate that they place equally much emphasis on these areas, irrespective of age of children. No difference in scores between novice and exert teachers suggest that professional beliefs is a complex variable that needs a more sophisticated exploration.

The benefit of the study was in providing important data on thinking of preschool teachers in the Czech context. In the Czech Republic there have been fierce discussions among professionals whether or not attendance of 2-year old children in preschool is developmentally sound. This study could not resolve this issue because it was targeted on teachers rather than on children. However, the data show that teachers believe in all-round education of children even if theory are 2-year old. Though care is a dominant component of their beliefs, it is accompanied with other pedagogical areas as well.

There are several limits of this investigation. The samples were locally anchored (eastern part of the Czech Republic) and bring findings that are important for this region. However, they do not allow extrapolation to the Czech population. Second, professional belief appeared as a personal characteristic that needs more subtle investigation including the use of interviews or other qualitative research methods. Third, it is necessary to find out how teacher beliefs are associated with teacher practices in classrooms. Previous studies provided inconclusive findings on this issue, therefore, more research is needed to reveal associations between these two teacher characteristics.

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# Project-Based Learning, Real Practice and Augmented Reality. *Diario De Las Bellas Artes*. Printed and New Media Newspaper

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## ABSTRACT

"Diario de las Bellas Artes". Diario de Teruel. It is a collaboration between Diario de Teruel and the Grado en Bellas Artes of Universidad de Zaragoza. In a pioneer manner –for the third consecutive year– photographs of all the news of the day are replaced by illustrations made by students and teachers of the degree, incorporating enhanced reality, animations and interactivity inside the pages.

"Diario de las Bellas Artes" seeks innovation in traditional newspapers, through new technologies and multimedia. In agroundbreaking way, it incorporates interactive, multimedia and augmented reality news in written press. You can get access to the interactivity of the paper issue by using internet from your smartphone, tablet or computer.

The three previous editions of *"Diario de las Bellas Artes"*. *Diario de Teruel* are available in the following link: <u>http://diariodelasbellasartes.blogspot.es/</u>

## **INTRODUCTION**

Real experience: communication, information and technology.

- *Diario de las Bellas Artes. Diario de Teruel.* Collaboration project between *Diario de Teruel* –one of the main local newspapers of the city– and the Bachelor in Fine Arts of Zaragoza University. In a pioneering and innovating manner, newspaper pictures are replaced by illustrations made by students and professors of the degree for the third year in a row. Moreover, their creations include augmented reality, animation and interactivity.
- The project is developed within the academic context of the Bachelor in Fine Arts. It is a cross-disciplinary and cross-curricular activity, although there are some courses more involved such as graphic design, illustration and engraving. Besides, it allows the implication of other disciplines like sculpture, performance, audiovisual and animation, among others.

The third *Diario de las Bellas Artes. Diario de Teruel* editions can be consulted in the following link: http://diariodelasbellasartes.blogspot.es/

- The two first covers are shown on screen. The first one consisted of a spread double-page artistic cover, while the second one was an informative cover.
- The third edition was published on 5<sup>th</sup> May 2017. For the first time, the cover had no headline, so all the information is given by the illustration which is, at the same time, a tribute to Tintin comics.
- There is only one similar preceding work, which was done by the French newspaper *Libération*, on the day Hergé was deceased in 1983. They made a whole edition of their newspaper illustrated by Tintin comics.

## THE STUDY

#### **OBJECTIVES AND ACADEMIC CONTEXT**

- Enterprise + University + City
- o Coexistence between paper newspaper and ICT
- Teamwork. A total of 110 people have collaborated to publish the two editions of [03/26/2015] and [04/21/2016]: more than 15 professors, 75 students and 22 professionals.
- Increasing Bachelor in Fine Arts visibility, its disciplines and capabilities by real practice. Contact with working world and students' experience. Acting as acquired knowledge integration support.



#### **TEACHING METHODOLOGY**



Picture 1: Schematic representation of the various active methodologies carried out in the project *Diario de las Bellas Artes*.

This initiative is set within the context of the 'Active Methodologies'. We depart from the methodology of the project-based learning (PBL), reinforced by a strategy of self-evaluation and constant improvement. Interactive methodology is also considered, strongly marked by teamwork: enterprise coordination, communication between students and professors/editors and support, communication and collaboration with other professionals. A graphical representation of the teaching methodology can be explained as it follows:

The design of this PBL with *Diario de las Bellas Artes* consists of an integrating project where acquired knowledge at University courses turn into a real, innovative and differentiating final product. The base of the whole idea can be summarised by John Dewey's theory 'Learning by doing': the best learning is experiencing, learn by practice. Below, we analyse the diverse methodology applied:

Innovation: at the end, we have a new product which has a different way of spreading information throught art, gathering together paper and ITC. Innovation, investigation and change have a strong influence during the process.

Service-learning and Entrepreneurship: Work and social media communication are strongly related by several factors. They are closely connected to reality and, at the same time, they address the news in an active and thoughtful way. In addition, it is structured by an idea of entrepreneurship and novelty as changing agent.

STEA: Combination between Science, Technology and Art. Students develop a real-problem solving project during a complex, meaningful and interesting process thanks to the combination of knowledge in a wide range of disciplines: illustration, computer graphics, audiovisuals, 2D and 3D animation, image processing and art history, among others. Besides, it implies an exhaustive analysis of media and the latest news, as well as making round-table discussions in class about how to graphically express news information and evolution.

Collaborative learning: Students work in teams to achieve the final result. They start by making an analysis of the news, and then they elaborate proposals and sketches to, finally, lean toward a solution. The key of the project is its interdisciplinary nature, because many of the competences developed in the practice come from a variety of courses. Crosswise work is also present, as it is usual that, for instance, they begin to work using one painting technique to finish it either with digital illustration or by incorporating interaction or animation.

Workshops: daily news illustrating practice, learning is self-directed in a real scenario. Students know competently their knowledge and what to do with it. To achieve this goal, we have previously organised 3-day workshops with the following content: 'Analysis of media, news and their pictorial representation'; 'Concept creation'; and 'Fast illustrating techniques and graphic resources'. During these workshops we combine the best part of lectures with problem-solving based practice.

The result is an analysis of news showing the solution throughout the final product.



Image 2: Students of 3rd and 4th year of the Degree in Fine Arts working on the edition of the Journal of Fine Arts. The photographs are taken during the work session of 04/25/2016 in the Graphic Design Room of the Fine Arts Building (left) and in the headquarters of *Diario de Teruel* (right). In the center are some pages of the Diario de las Bellas Artes.

## SUPPORTING ITC

Regarding information and communication media, we have followed up printed and digital newspapers, as well as other sources such as TV, radio, Facebook or Twitter. Afterwards, we made a brainstorming session in the classroom about international, national and local latest news. Also, we made an analysis of press images, graphics and illustrated news.

Regarding software, we use augmented reality with Vuforia y Unity; Bidi codes; Animations with Photoshop and Flash. Image processing programs: Photoshop and Illustrator. Code image generation: Processing. Layout design programs: InDesign/QuarkXPress. Recording and editing audiovisuals: IMovie, Adobe Premiere. Broadcasting: Youtube.

## TRANSFER OF RESEARCH RESULTS

Most of the technological applications have been taken from a previous research project entitled 'Design, Engraving and Illustrating. New media: digital books', financed by Antonio Gargallo University Foundation of University of Zaragoza.

Here you can see an illustrated scheme where the four researching areas of the project are represented: digital books and museum interactivity, digital natives, classroom digital books and digital books factory.

This is an animation made by Vuforia, where the images is, at the same time, a code, thanks to the creation of an app.

Here another example of interactivity is shown, where the access to the video is made by a Bidi code. In addition, we apply teaching resources, as the video is also made with the teaching methodology of 'visual thinking'.



Image 3: Some examples of access in newspaper interactivity with digital content. (Right.) Página de Diario de las Bellas Artes with interactivity using QR code printed and by code-image. (Left)



#### **INNOVATIVE NATURE**

The project consists of a real practice, where students acquire knowledge and learn professional working methodology, working together with journalists. Students attend to the newspaper headquarters at 11 am, where they celebrate the first editing meeting, as well as news assignation, according to students' interests or the previous weeks work they have been following up –economy, international affairs, Aragon regional news, etc. Next, they have a meeting with the journalist in charge of writing the news so that they can exchange impressions about the perspective and different aspects of it. In some cases, students even accompany the journalist to the press conference to cover the news. From then on, the work gets more and more intense, as the illustrations have to be handed over before 9 pm. Students work either at the newspaper headquarters or at the University Fine Arts building under their professors' supervision.

In a pioneering manner, a newspaper *–Diario de Teruel–* and a University –Zaragoza University– work together to tell daily news from a different point of view. The objective is not to produce an special edition of the newspaper, but to entirely illustrate quotidian news maintaining information rigour and communication media speed thanks to the graphic reflection made by the students. Thus, typical press photographies are substituted by images and illustrations of students and professors of Bachelor in Fine Arts.

Printed edition binds together with new technologies. This way, throughout its pages, images show interactivity thanks to augmented reality, animations, etc., developed with Bidi codes or graphics made by Apps.

From teaching innovation point of view, this activity means a common project between disciplines of the Bachelor, transfer of research technology aspects both to the classroom and the enterprise, and real practice.

#### **IMPROVEMENTS IN STUDENTS' LEARNING PROCESS**

The key to promote learning: developing a real ptoject

Motivation: curriculum, social acknowledge

Most important factor: personal satisfaction for a well-done work

## SUSTAINABILITY AND TRANSFERABILITY

Individual practice and student learning process: illustration, animation, augmented reality, design, etc. are transferable to professional scope: not only to editorial sector by extension, but also to graphic design. However, the project as a whole –coordination, image creation process with a tight one-day deadline and innovation and interactivity incorporation in some of them– implies a high level of implication.

To make this project continuous and sustainable, it is basic that we have an active group of collaborating professors, as well as participating students.

#### CONCLUSIONS

The project has been awarded by Banco Santander Chair and University of Zaragoza with the title 'VIII Edition of the award in good teaching practices supported by ITC. 2017'.

The project has lead to both a qualitative improvement of knowledge and a motivation practice.

*Diario de las Bellas Artes. Diario de Teruel*, has been an instrument to develop students of Bachelor in Fine Arts employability.

The project has a continuity character, empowering quality strategies, creativity and innovation to achieve differentiating future results.

Time invested on teaching can be justified as curriculum viate builder. Thus, we have developed an strategy to foster project's visibility, acknowledgement and official registration as pioneers: teaching innovation project, website, publications, specialised and dissemination journals, congress communications, award participation, among others.

To journalism and communication fields, it has implied a different practical way of telling the news.

The print run of *Diario de las Bellas Artes. Diario de Teruel* doubles in number of copies and pages the regular format of the newspaper. Projects' repercussion and citizens' reception have largely exceeded the planned objectives, as it can be seen in the following section:



MEDIA IMPACT

20minutos http://www.20minutos.es/noticia/2415376/0/diario-teruel-publica-numero-extraordinario-ilustrado-po r-alumnos-docentes-bellas-artes/

ABC http://agencias.abc.es/agencias/noticia.asp?noticia=1825925

La 2 Noticias https://www.youtube.com/watch?v=70Q8OEdnoO0

TVE Aragón https://www.youtube.com/watch?v=6yvV6WbGNws

Aragón

Radio <u>http://www.aragonradio.es/podcast/emision/el-diario-de-teruel-%E2%80%98cede-sus-paginas-a-los-estud</u> iantes-de-bellas-artes/

Aragón Radio

2015 <u>http://www.aragonradio.com/diario-de-teruel-publica-un-numero-extraordinario-ilustrado-por-alumnos-y-d</u> ocentes-de-bellas-artes/

Aragón Digital <u>http://www.aragondigital.es/noticia.asp?notid=143960</u> El Periódico de

Aragón http://www.elperiodicodearagon.com/noticias/aragon/venden-ilustraciones-diario-bellas-artes-banco-ali mentos\_1108193.html

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## Promotion of Active Learning by all Faculty Members

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## ABSTRACT

For more than fifteen years, National Institute of Technology (NIT), Gifu College has promoted the practice of education aimed at improving students' activeness through ICT equipment. We have been making educational materials used in active learning (AL) classes based on the viewpoints of our college graduates who have worked long for companies, and has established a system where students who have learned the educational content can gain "practical engineering credit point" (PECP) through extracurricular activities. Measured data has revealed that faculty's involvement in AL, faculty development (FD) and PECP has had students learn more actively and more voluntarily than before, both in the formal curriculum and in extracurricular activities.

## INTRODUCTION

In our college, we have been promoting AL for more than 15 years, while supporting it with e-Learning and ICT. The past educational practices led to the acquisition of the "Acceleration Program for University Education Rebuilding (AP)" (2014) with six-year major financial support from the Ministry of Education, Culture, Sports, Science and Technology (MEXT). This enabled us to introduce various ICT equipment and systems useful for promoting AL. Specifically, we introduced a total of 257 tablet and notebook PCs for classroom use up to last year (162 tablet PCs (Toshiba), 50 notebook PCs (Fujitsu), 25 surfaces (Microsoft), 20 notebook PCs (Asus)). Also, the wireless LAN device was set up for use in all the 25 classrooms of all the years (from the first to the fifth year) of all five departments, so that the 257 PCs could be connected to the network under the control of MAC address. Moreover, we installed electronic blackboard systems in the 25 classrooms and introduced a server as well as various kinds of software for making educational materials which could be used in the systems. (Ogawa, Tokoro, Shimizu and Itoh, 2016, Ogawa, Tokoro, Shimizu and Kitada, 2015) With the aim for all faculty members: (1) FD sessions related to AL (Bergmann and Sams, 2012, Bonwell and Eison, 1991, Brant, Hooper and Sugrue, 1991, Hake, 1998, Hoellwarth and Moelter, 2011, Khan Academy, 2006, Kapur and Bielaczyc, 2012, Lage, Platt and Treglia, 2000, Renkl, Atkinson, Maier and Staley, 2002,



Westermann and Rummel, 2012) after a faculty meeting which is held seven times a year, (2) FD sessions held twice a year, one time in the first and second semester, respectively, (3) Pluriannual FD sessions held regarding special topics such as how to make lesson plans useful for AL and how to use new ICT equipment.

In our college, all faculty members are supposed to categorize their styles of AL classes into three levels at the beginning of an academic year. Specifically, when designing a syllabus, respective teachers are supposed to select the type of AL from among the three they will practice in each class, and describe the selected type in their syllabus.

We established a system of visualizing and evaluating students' activities outside the formal curriculum, that is, those in the quasi-curriculum as well as in the extra curriculum. They are not directly related to credits necessary for graduation. However, respective departments are encouraging students to actively work on the quasi and extra curriculum activities by giving their own incentives to students. The details are described below.

## The formal curriculum, the quasi-curriculum and the extra curriculum

In our college, we are working on visualizing students' activities by classifying them including those outside the formal curriculum. The education classification is classified into three: the formal curriculum, the quasi-curriculum and the extra curriculum. The formal curriculum consists of subjects which are given credits necessary for completing the courses. The quasi-curriculum consists of subjects to which credits are to be given irrespective of completing the courses. The extra curriculum indicates students' autonomous activities authorized by our college, except for the formal and quasi curriculums. Our college set PECP for the quasi and extra curriculums, visualized students' activities, and developed a system to evaluate them.

## The list of PECP

Our college established the "practical engineering credit point" system (the "PECP" system) and put it into practical use at a collegewide level. Respective departments discussed whether to give PECP or not, and the appropriate number of points if given, for students' various autonomous activities in the extra curriculum. After the process was completed, in the academic year 2015, our college determined the list of PECP (Table 1, 2) used throughout our college, where the names of authorized students' activities and the given number of points were described.

	NIT	Classification
English Presentatio n Contest for Students in Colleges of	NIT Colleges Athletic Meeting	Name
NIT	NIT	Management Organization
1-3	1-4	Practical Engineering Credit Point
		Education Other Tha Curricului Quasi-curricului m
0	0	Category an Formal m Extra curriculum
50%		Catego Fundamental skills
		ry Specialized skills
50%		⊈ Versatile skills
	100%	Attitude and orientation (human power)
		Comprehensive learning experience and creative thinking power

**Table 1**: The list of the practical engineering credit point (a common point of view of all departments).



	Technolog v									
	NIT Colleges Robot Contest	NIT	1-8		0		50%			50%
	NIT Colleges Programmi ng Contest	NIT	1-3		0		50%			50%
	NIT Colleges Design Competitio n	NIT	1-3		0		50%			50%
	NIT Colleges 3D Printer Contest	NIT	1-2		0		50%			50%
	NIT Colleges Japanese Chess Tournamen t	NIT	1-2		0				100%	
NIT, Gifu Cc	Off-campu s practical work	NIT, Gifu College	1 for every 5 days	0			50%	50%		
ollege	Training regarding literacy for creating products	NIT, Gifu College	1 for every 5 days and 30 hours	0			50%	50%		
	Award by President of NIT, Gifu College for class leaders	NIT, Gifu College	1		0				100%	
	Award by President of NIT, Gifu College for students with outstanding academic results	NIT, Gifu College	1		0	50%	50%			



Award by Wakaayu-k ai of NIT, Gifu College (except award by President)	NIT, Gifu College	1	0	20%	20%	20%	20%	20%
Academic exhibition in college festival	NIT, Gifu College	1-2	0		50%	50%		
Book report competitio n (free contributio n, illustration, mascot character)	NIT, Gifu College	0.5-1.5	0	50%			50%	
Book hunting	NIT, Gifu College	0.5	0	50%			50%	
Board member of the student council	NIT, Gifu College	0.5-1	0				100%	
Board member of the dormitory student council	NIT, Gifu College	0.5-1	0				100%	
MS leaders	NIT, Gifu College	0.5	0				100%	
Science volunteer	NIT, Gifu College	1 point for each case	0		50%		50%	
Award by respective department s (credit certified by subject teachers)	NIT, Gifu College	1 point for each case	0		50%	50%		



1	<b>X</b> 7 1 .									
	Voluntary learning outcomes of 45 subjects highly recommend ed by corporate engineers	NIT, Gifu College	1	0		50%	50%			
Technical s	Mechanical Drawing Proficiency Test	NAPTSHS	1		0		100%			
senior high scl	Calculation Skill Proficiency Test	NAPTSHS	2		0		100%			
hool	Informatio n Technolog y Examinatio n	NAPTSHS	1-3		0		100%			
	Computer Application Examinatio n	NAPTSHS	2		0		100%			
Acaden	Research paper	Respective academic conferences	2-8		0		100%			
nic confere	Conference presentatio n	Respective academic conferences	1-5		0		100%			
nce	Contest award in academic conference s	Respective academic conferences	Decisio n through delibera tion each time		0		40%	20%	20%	20%
	Contest essay for high school students, Institute of Electrical Engineers of Japan	Institute of Electrical Engineers of Japan	1-4		0		50%	50%		
Basic mbioc	EIKEN Test in	Society for Testing	1-8	0		100%				



Practical English Proficiency	English Proficiency							
TOEIC	Institute for International Business Communicat ion	1-8	0		100%			
TOEFL iBT	Council on International Educational Exchange	1-8		0	100%			
English Technical Writing Test	Japan Society for Technical Communicat ion	1-8	0		50%	50%		
Internation al Arithmetic and Mathemati cs Proficiency Test	Society for International Arithmetic and Mathematics Proficiency Test	1-3		0	100%			
Practical Mathemati cs Proficiency Test	Japan Mathematics Aptitude Testing Foundation	1-3		0	100%			
Practical Mathemati cs Proficiency Test, Winning of the Grand Prix	Japan Mathematics Aptitude Testing Foundation	Decisio n through delibera tion each time		0	100%			
Japan Kanji Aptitude Testing	Japan Kanji Aptitude Testing Foundation	1-5		0	100%			
Japanese Language Aptitude Test	Association of International Education, Japan	1-4		0	100%			
Japan Science Testing	Japan Science Testing Foundation	1-2		0	100%			

German Language Aptitude Test	Association for the Promotion of German Language and Literature	2-8	0	100%		
Practical French Proficiency Test	French Language Education Institution	1-8	0	100%		
Spanish Language Aptitude Test	Japan-Spanis h Society	2-8	0	100%		
Chinese Language Aptitude Test	Japan-Chines e Society	1-8	0	100%		

Table 2: The list of the practical engineering credit point (an original point of view of respective departments).

	learning experience				
	Aminude and				
	orientation				
kills	Versatile skills				
gory of S	Specialized skills	100%	100%	100%	100%
Categ	Fundamental skills				
ation gory r Than al iculum	Extra curriculum	0	0	0	0
Educa Categ Other Form Curri	Quasi-curriculum				
Practical Engir	neering Credit Point	5	1	1	1
Management C	organization	Institution of Professional Engineers, Japan	Japan Fire Engineering Qualification Center	Tokyo Chamber of Commerce and Industry	Computer Software Association of Japan
Name		Success in the first stage professional engineer examination	Handling dangerous substances	Environmental Society Certification Test	CAD Use Engineer Examination
Classification		Specialized fiel	ds		

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Mechanics	Mechanical Design Engineer Examination	Japan Mechanical Design Industry Association	5	0	100%		
Electronic	Licensed electrical engineer	Examination Center for Electrical Engineer	2-3	0	100%		
S	Licensed electrical Communication engineer (transmission switching)	Japan Data Communications Association	2	0	100%		
	Licensed electrical Communication engineer (railway track)	Japan Data Communications Association	2	0	100%		
	Installation technician	Japan Data Communications Association	1-6	0	100%		
	Electrical worker	Examination Center for Electrical Engineer	2-4	0	100%		
	Amateur radio enthusiast	Japan Radio Institute	1-4	0	100%		
	Land radio technique professional engineer	Japan Radio Institute	1-8	0	100%		
	Land special radio technique engineer	Japan Radio Institute	1-2	0	100%		
	Marine special radio technique engineer	Japan Radio Institute	1-2	0	100%		
Informat	Typing Skill Proficiency Test	e-typing Corporation	1-2	0	100%		
ion	IPA Examination (Information Technology Passport Examination, Basic Information, Applied Information)	Information-Technology Promotion Agency	1-8	0	100%		
	Digital Technology Certification	Practical Business Testing Foundation	1-3	0	100%		
	Information	Association for Promoting	1	0	100%		



	Proficiency Test	Education at Special Training School					
	CG Engineer Proficiency Test	Association for Promoting Image Information Education	1-2	0	100%		
	Image Processing Engineer Proficiency Test	Association for Promoting Image Information Education	1-2	0	100%		
	Multi-Media Proficiency Test	Association for Promoting Image Information Education	1-2	0	100%		
Civil en	Land surveyor & Assistant Land surveyor	Japanese Association of Surveyors	2-4	0	100%		
gineeri	Civil engineer	Japan Society of Civil Engineers	2	0	100%		
ring and Environme	Examination for Engineering Work Execution Process Supervisors	Japan Construction Training Center	2	0	100%		
	Pollution control manager	Japan Environmental Management Association for Industry	1	0	100%		
	Qualified Biotope Manager	Ecosystem Conservation Society - Japan	1-2	0	100%		
	3R Low-carbon Society Test	Executive Committee of 3R Low-carbon Society Test	0.5- 1	0	100%		
Architect	Real-estate transaction specialist	Real Estate Transaction Improvement Organization	6	0	100%		
ure	Color coordinator	TokyoChamberofCommerce and Industry	1-2	0	100%		
	Color Test	Color Test Association	2-3	0	100%		
	Coordinator of Welfare Dwelling Environment	Tokyo Chamber of Commerce and Industry	2-3	0	100%		



Architecture CAD Test	Japan Architecture CAD Association	2	0		100%		
Personal Computer Proficiency Examination (P-ken)	P-ken Association	2	0		100%		
ICT Skills Proficiency Examination	Link Academy	2	0		100%		
Exhibitions of excellent works created by students majoring in architecture/hu man life/arts, Gifu	Gifu, Tokai branch office, Architectural Institute of Japan	2-3	0		100%		
High school Architecture Koshien	JapanFederationofArchitects& BuildingEngineersAssociations	2-4	0		100%		
Design contest of Architectural Institute of Japan	Architectural Institute of Japan	6-10	0	25%	25%		50%
Student contest of Aichi Architects Associations	Japan Federation of Architects & Building Engineers Associations	1-3	0	25%	25%		50%
Second-class architect	Japan Architectural Education and Information Center	4-10	0	50%	50%		
CAD engineer (Class 2)	Computer Education Institution	1	0		100%		
3D CAD user engineer (Class 2)	Computer Education Institution	1	0		100%		
Interior coordinator	Japan Interior Industry Association	4	0		100%		
Interior architect (Class 2)	Society of Japan Interior Technology	4	0		100%		
Interior Designer Certificate Test	Japan Design Planner Association	1	0		100%		
Real-estate surveyor	Japan Real-estate surveyor Federation	5	0		100%		

Construction Managing Engineers Class 2 (architecture)	The Fund for Construction Industry Promotion	2	0	100%		
Condominium Manager	Condominium Management Center	1	0	100%		

## The PECP system to give incentives

In the list of PECP, skills are categorized into five: Fundamental skills, Specialized skills, Versatile skills, Attitude and orientation (human power), Comprehensive learning experience and creative thinking power.

For example, PECP of "NIT Colleges Robot Contest" ranges from 1 to 8 (see the third box from the top, Table 1). When a student applies for a point after participating in the contest, then the faculty evaluate his or her activities and give the student 8 points (maximum) if evaluated "highly excellent", and only 1 point if "very poor". Also, the contest belongs to "Extra curriculum", not to "Quasi-curriculum". Moreover, both its "Specialized skills" and "Comprehensive learning experience and creative thinking power" are set as 50%. Thus, a student who participates in the contest and wins 5 points through the faculty evaluation will be given 2.5 points (50% of 5 points) as "Specialized skills" and also 2.5 points (50% of 5 points) as "Comprehensive learning experience and creative thinking power".

PECP, which is gained from activities in the quasi and extra curriculums, is not included in graduation requirements. Therefore, as shown below, respective departments set up their own incentive system to encourage students to gain more points. Each of them is in favor of those who have gained more.

- ✓ Incentives at the Department of Mechanical Engineering: Prioritizing students for graduation research laboratory and job recommendation
- Incentives at the Department of Electrical and Computer Engineering: Prioritizing students for course selection and graduation research laboratory
- Incentives at the Department of Electronic Control Engineering: Prioritizing students for a medium-scale experimental subject in the fourth year
- V

 $\checkmark$ 

- Incentives at the Department of Civil Engineering: Aggressive challenge for the first stage professional engineer examination and sharing the record of successful examinees
- Incentives at the Department of Architecture: Prioritizing students for lending a drawing board for the examination for class-2 architects, prioritizing students for internship placement, job placement and further education

According to aggregate results, the students at the Department of Electrical and Computer Engineering, which was the first to introduce the system among the five departments, tend to gain PECP in a positive manner, hoping to enter the course he or she wants to take when selecting a course. The other four departments, which are going to start full-scale operation in or after this academic year, are expected to show a similar tendency.

## The 45 subjects highly recommended by corporate engineers

In this project, some senior graduates of our college selected 45 kinds of subjects from the viewpoint of corporate engineers who are/were playing a key role in Japanese high-tech industries, and after that, we, together with the graduates, created educational materials by using the educational content. The 45 subjects highly recommended by corporate engineers (45 SHRCE) were classified according to specialized fields such as "Liberal Arts", "Natural Science", "Practical Mechanics", "Electronics", and "Environment". For example, a specialized field of "Liberal Arts" corresponds to a subject in the formal curriculum. The subject ("Liberal Arts") contains several kinds of items, and each item corresponds to a class (lecture/exercise lesson) of the subject. Moreover, each of the 45 subjects has content of the introductory, intermediate and advanced levels. The 45 SHRCE was developed with students' voluntary learning in mind, and therefore, we adopted a function to manage their learning automatically. Also, we added the 45 SHRCE in the "PECP" system, as shown in Table 1. Moreover, we prepared exercises of CBT for each of the introductory, intermediate and advanced levels, and introduced a system to manage student performance.



#### CONCLUSIONS

The promotion of AL in our college is characterized in that all faculty members are practicing it. With respect to the subjects in the formal curriculum, respective teachers are visualizing their degree of AL by describing three levels of AL in each class in their syllabus. With respect to the quasi and extra curriculums, we are visualizing the degree of activity in students' AL by means of a server for visualizing the acquisition status of PECP. Japan is a technology-oriented nation, and its basis is manufacturing industries that possess world-class technology. From this point of view, senior graduates of NIT colleges are regarded as irreplaceable human resources who, with problem solving experiences covering a wide range from creating products to company management, serve as the backbone of Japanese manufacturing industries. Our college is placing emphasis on education with the perspective of senior graduates who have problem-solving skills. We are promoting AL by improving students' active nature in each of the formal, quasi and extra curriculums. Our college started to give students credit points with the PECP system on a full scale, as a main pillar for visualizing learning outcomes of the quasi and extra curriculums in our college AL promotion project.

#### ACKNOWLEDGEMENTS

The description of this study was promoted financially supported through the "Acceleration Program for University Education Rebuilding" by the Ministry of Education, Culture, Sports, Science and Technology, Japan. We would like to express our gratitude for the support.

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# Relationship Between Mass Media and Education: Case of Jordan.

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## ABSTRACT

The paper is showing the relationship between the mass media and education. It contains the role, importance and effects of mass media on education in underdeveloped countries. It also talks about the use of media in classroom and in the teaching learning process. This paper is representing the extensive and extreme use of media in education contents and its social impact upon society because of its inherent ability to reach large number of public. We will take for example "jordan" and through specific examples and statistics, we will analyse the whole process starting on 2011 with the Arab spring.

## Intro/Motivation

Our research paper is showing the relationship between the mass media and education. It contains the role, importance and effects of mass media on education in underdeveloped countries. It also talks about the use of media in classroom and in the teaching learning process. This paper is representing the extensive and extreme use of media in education contents and its social impact upon society because of its inherent ability to reach large number of public. As Field of study, We will take for example "Jordan" and through specific examples and statistics, we will analyse the whole process starting on 2011 with the Arab spring.

#### **Role of Mass Media in providing Education**

Mass Media is the tool or technology that take several form such as Internet, Television, newspapers..etc This tool can be used by someone to transfer a positive or negative message to a huge number of people in all over the world. Media is a gift given to humanity because Media has enhanced education and education has improved media. There are two major ways to using media and technology in Schools or any educational institution. First, students can learn "from" media and technology in many field of knowledge, and second, they can learn "with" the media and technology, using it simplify learning process because students have easy access to any source of science. So, Education and Media are integral part of learning, They form a person and transform society. In the twenty first century, education could not be limited within teacher and taught without social environment. It is obvious that Media is one such strong power that exist in the social environment of education. Using these modern electronic techniques and technologies, Mass media proves that education is, really comprehensive and not confined within four walls of the classroom. So it is really clear that mass media is the educational medium for the mass and mass education. Students/ learners get a great deal of information from the widespread mass media. We would estimate that mass media may substitute the real classroom teaching in future.



#### **Functions of Mass Media**

The media has the power to enable the adaptability of the educational process to the individual student's differences in pace, temperament, background, and style of learning. These media can perform many of the following functions involved in the educational process: 1) The media helps in disseminating information for the mass. People acquire different knowledge very quickly and have access to it when it is wanted. 2) The Media helps in providing vocational and professional information to a larger group of the community. 3) The People can be aware of different problems of the society and their role in changing society through mass media. People know their rights and duties for the nation clearly. 4) They can give the student the opportunity to reach the material and respond in many ways. 5) The Mass Media help in forming suitable habits for different programmes and they utilize their leisure time in a productive way. It also influences the behavior of people through different programmes. 6) Now in Jordan mass media is not treated as informal agencies of education. They are called non-formal agencies due to its wide coverage of educational items in a systematic way. It is viewed that these media can substitute the classroom teaching in future.

Educational technology is considered as an effective approach to instruction, since it's objectives are defined, the logical blocks in the argument worked out, and students tested for their ability to absorb the blocks at different rates in different sequences etc. The media was born of the communication revolutions which can be used for instructional purposes, alongside the teacher, textbook and blackboard. The components that make up educational technology include television, films, overhead projectors, computers, and the other items of hardware and software. In nearly every case, the media have centered education independently, and still operate more in isolation than in combination.

## Mass Media for education in underdeveloped countries

Mass media, print media and its usage, play an important role for the development of education in the underdeveloped countries, such as Jordan. Various forms of mass media can be used for the development of education in underdeveloped countries. The twenty first century witnessed a fast and huge development in societies, Mass media offers societies and its inhabitants a great number of new possibilities. Predominantly, these unique opportunities concern the advancement of social media that have noticeably permeated the modern education world. In fact, it is not a secret that the majority of teachers and professors, in Jordan, highly appreciate the power of these tools which lies in the ability to engage, motivate, as well as to involve the students into deep contemplation and sensible discussion. To some extent, it is a two way discussion which brings people together to discover and share some information, interests, as well as ideas.

#### **Implementation of Social Media Into Educational Life**

It is important to note that social media is occupying more and more of our online time and in many ways is becoming a preferred method of communication. This begs the question: how do we educate today's students on the best practices of using social networks?

Nowadays, many educational establishments in Jordan are beginning to embrace social media into their everyday life. It is a wellknown fact that Twitter and Facebook are considered to be the fastest ways of finding information that might be of great value for all students.

It may be challenging to bring a social network like Twitter into your classroom or school In a country like Jordan, But another option is to create a social media class. With a structured environment that the teacher controls, there is a big opportunity to teach students about using these platforms as creative writing and communication tools. Remarkably, these websites can be used for:1) Creating a discussion in the classroom for a new topic or a topic that previously published online. Interestingly, it is possible to create a chat room on any secure website that can be embedded later to some blog and scheduled to open at a specified time. 2) Speaking about various blogs which can be utilized to encourage creative writing and to enrich grammar skills.



3) On the whole, one of the biggest assets of each social media tool lies in bringing together the students of all ages to help them with all types of assignments, starting with the homework and finishing with different researches.
4)Media can assist the students in solving their engagement crisis. Indeed, In some jordanian institution, the lack of engagement has become the main reason for students' expulsion both from the course and college. In this case, social media engages them into close communication and collaboration with their instructors so that the studying process is properly maintained.

#### The Importance of Media in the Classroom

The classroom is a closed place with four walls, therefor it need always refreshment. Media act perfectly as a direct refreshment in our present time because Media in the classroom engage students in learning and provide a richer experience. Media components are useful tools for illustrating a lesson, allowing students to see examples of what they are learning easily and quickly. Interactive media such as Smart Boards allow students to move items on a screen for illustrative purposes. Media Appeals to Multiple Learning Styles such as visual, auditory and kinesthetic learners, those learners can watch a movie, listen to music or interact with digital media on an interactive Smart Board. Media creates an Authentic Learning Experience: the different type of media provides authentic opportunities for students to learn using real-world media. Learners must read, evaluate and interpret information based on items that they need in their daily lives. Media als has the power to strengthens Critical-Thinking Skills: Teachers can help the learners in using the media to ask probing questions and facilitate discussions that extend beyond basic comprehension questions. For example: Students can write a story, interpret a documentary or interpret a news broadcast. Finally, Meda Teaches Students to Use Media and care for resources to further their education because with the time , students become experts which enable them to determine the value of media and learn methods to contribute to society, producing their own media.

#### CONCLUSION

In this chapter we attempted to analyse the mass media's importance and role in education in an underdeveloped country like Jordan. The revolution in information technology has equipped the media with huge power. In the present digital age, multimedia access which is a powerful mechanism to accelerate the development in education through distance learning. We have the media like Internet, which is equivalent of a telephone, fax and radio, TV all rolled into one service. It has been observed that if mass media could be appropriately used to the suiting and to the learning needs created by the forces of change like population explosion, knowledge explosion, electronic distance education and technological explosion. So, The media has the power of educating people, the good and the bad. Since it affect the eyes, the ears and the mind simultaneously nothing can overcome the influence of the media. The media in Jordan performs a noble mission of enlightening people and discourage sectarian, communal and divisive trends. It did change the educational system radically and students depend more and more on MEDIA.

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# **Resilience Inventory and their Psychometric Properties**

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# ABSTRACT

This research is aimed at estimating the psychometric properties of an inventory of resilience in order to explore its operation in university students. 1196 We worked with students of the Academic Unit of Social Sciences of the Technical University of Machala, Ecuador, of which 61.7% were female and 38.3% male. The mean age was 22 years with a standard deviation of 6.54. The methodology was divided into three stages: the first addressed to the descriptive analysis of the reagents. The second focused on the estimation of the exploratory factor analysis and the third, in the calculation of confirmatory factor analysis. In conclusion inventory it consists of 14 reagents resilience explaining the 44,894% of the variance associated with the construct was achieved. The factorial solution identifies four factors: psychosocial coping, confidence in solving problems, humor and positive evaluation of what I lived and self-regulation. This model is fitted under the statistical evaluation done. As for reliability, the inventory showed a Cronbach's alpha of .889 and .887 Omega McDonald, both with p value of .001

Key words: resilience, psychometric properties, psychosocial coping, self-confidence.

# **INTRODUCTION**

The resilience is inspired in the behavior of the physical bodies that are capable of returning to its original state, after having been submitted to high temperatures (Grotberg, Paladini, Suárez and Melillo, 2008). Werner and Smith, by means of its studies on the adaptive capacity of born children from Hawaii in vulnerable situations, transfer the concept to the field of the psychology naming this property as resilience (Uriarte Arciniega, 2005).

Currently, the complexity of such a construct has woken up the interest of multiple investigators of the area of the health (Vinaccia, Quiceno, Remor, 2012; Ruiz & López, 2012), education (Trujillo, 2011; López, 2010), psychology (Morelato, 2011), managing to present it like a multidimensional concept which components arose from the interaction of such aspects like: independence, initiative, morality, humor, introspection, creativity, all of them put to the service of the confrontation of adverse situations and of the increase of the adaptive capacity of the subject.

Based on the special thing, the present research takes as a target to Value the psychometric properties of a scale of resilience directed to explore its functioning in young Ecuadoran university students. The relevancy of the study rests on the need that has the Ecuador of young people links in the diverse structures of its productive



device, where the estimation of the resilience is a factor that affects in the selection of personnel, competitiveness in the university educations, evaluation of the execution, between other aspects.

In addition to the previous thing, the functioning factorial of the scale, opening the reflection for the system creation of psychosocial intervention that they encourage the ripeness of this construct like input for the sustainability of ideas of personal efficacy and hence the achievement of the goals commonly raised in the population study object.

# METHODOLOGY

## PARTICIPANTS

The research developed with 1196 students of the Technical University of Machala (UTMACH), distributed in the careers of the Academic Unit of Social sciences of the following way: Plastic arts: 3.3 %, Social Communication: 7.4 %, Educational sciences Mention: Physical culture: 7.4 %, Basic education: 8.4 %, Initial Education: 7 %, Teaching in Computing science: 4.4 %, Social sciences: 2.3 %, Physics and Mathematics: 0.9 %, English: 1.7 %, Language and Literature: 2.4 %, Educational Psychology and Vocational Orientation: 2,5 %; Clinical psychology: 14,9 %, Jurisprudence: 13,7 %; Environmental management: 9,5 %, Sociology and Political sciences: 5.4 %, Social work: 8.8 %. As for the genre, 738 (61.7 %) was of the feminine sex and 458 (38.3 %) was of the masculine sex. The average of the age was 22 years with a standard deviation of 6.54.

# **INSTRUMENTS**

The instrument in study named type Likert an inventory of resilience (INRES) constructed with base in the norms stipulated for scales with format and shaped initially by 84 reagents. Its writing was focused in the routine character of the young Latin-American university people, from there that tackles situations of classroom, group meetings, psychosocial confrontation in university ambiences, between other interest aspects. To answer it there were considered to be five options faced to the evaluation of the frequency of appearance of the feature, like evidence of its incorporation to the behavior pattern of the subject. These alternatives were: To = Never, B=few, Time C = Sometimes, D=Most of the time, E = Always. The values allocation continues a sequence (never always) of 1-5 for the items positives and inverse in case of the negatives. The statistical estimation of the latent variables that form the instrument was realized in three stages, which next are described:

Stage 1. Descriptive analysis of the reagents: the target of this first stage is to value the changeability of the reagents in order to add that these behave like variables and that they assemble the conditions to calculate the exploratory factor analysis (AFE). In this estapa there were observed the measurements of central tendency and changeability of every reagent. Normality tests were estimated single-variant by means of the Kolmogorov-Smirnov test. In addition, to the previous thing the extracted communalities are explored. The precision of these elements was realized following the orientations of Cartwright - god and Pérez, (2005).

Stage 2: Exploratory factor analysis (AFE): for the purpose of analysis object determined the structure factorial latent of the instrument the AFE was used by means of the fulfillment of the following sub-stages (Lloret-Segura, Ferreres-Traver, Hernández-Baeza, and Tomás-Marco, 2014; Pere J y Lorenzo-Seva, 2014): a) Evaluation of the coefficients of interrelation observed in the information by means of the test KMO and estimation of the viability of calculation of the factor analysis by means of the test of Barlet's sphericity. b) Selection of the method for factors estimation: in this study there are considered not exaggerated square minimums (ULS) due to the expediency of its use in ordinal variables and counterfoils of interrelations polychorics (Freiberg Hoffmann, Stover, De la Iglesia, and Fernández Liporace, 2013). c) Rotation as the method PROMIN (Lorenzo, 1999). d) Factorial saturation of.4; e) 3-4 items for factor; f) Average quadratic residue ("Root Mean residual Square" RMSR or RMR) by means of closeness with the Kelley criterion; Index of fitting criterion (GFI "Goodness of Fit Index"), quadratic average Error of approach (RMSEA "Root Mean Square approximation error"). During this phase there used the statistical software FACTOR (Lorenzo & Pere J, 2006).

Stage 3: Confirmatory factor analysis (AFC). For the sake of validating the theoretical model previously identified by means of AFE and of it fitting to increase its aptitude to represent the construct in the population object of analysis (Batista-Foguet, Coenders, & Alonso, 2004; Pérez, Chacón & Moreno, 2000), one proceeds to establish the calculation of the AFC. The decision on its adjustment was based on the value obtained by the



indexes that next are identified (Orgaz Baz, 2008): To measure the entire adjustment of the model without valuing the over-adjustments the GFI was used, RMSEA and the RMR.

The incremental adjustment was estimated by means of the CFI, NFI, AGFI. In case of the indexes that indicate absolute or relative covariance proportion it is considered to be the adjustment if the obtained value is over 0.9. The indexes based on the standardized residues are considered to be exact if they show a value lower than 0.05. With regard to the slowness the index AIC was used. During this stage the software was used OWNERS.

# RESULTS

The descriptive result of the items suggests that the same ones assemble conditions for the application of the AFE. Of the whole of the initial reagents there were selected those that showed a typical deviation with values equal or superior to 1 and the asymmetry and kurtosis between the awaited limits. In this stage a whole of 14 reagents was selected (to see table 1).

ITEM	AVERA	SD	ASIM	CUR	K-S	Р.	СОМ
	GE					VALUE	
4	3.099	1.180	-1.065	0.708	8.361	0.000	0.430
5	3.443	1.028	-1.801	2.879	12.879	0.000	0.580
6	3.311	0.985	-1.463	1.472	11.586	0.000	0.704
24	2.420	1.198	-1.756	2.584	7.874	0.000	0.693
28	2.479	1.057	-1.871	3.300	7.571	0.000	0.520
37	3.956	1.031	-0.823	0.159	10.907	0.000	0.404
38	3.236	1.016	-1.261	0.888	7.623	0.000	0.517
53	3.947	1.049	-0.854	0.223	11.100	0.000	0.455
58	3.698	1.445	-0.565	-0.716	5.582	0.000	0.477
60	3.765	1.267	-0.591	-0.503	8.067	0.000	0.475
67	2.920	1.596	0.123	-0.984	6.571	0.000	0.561
69	3.321	1.174	-1.469	1.511	7.037	0.000	0.607
72	3.808	1.083	-0.530	-0.503	6.308	0.000	0.586
77	3.003	1.045	-0.917	0.340	7.774	0.000	0.591

Table 1: Descriptive statistics of the reagents.

SD: Standard Deviation ASIM: Asimetry CUR: Curtosis. K-S: Kolmogorov- Smirnov Normality test COM: Communality

The average of the reagents was located about the average point of the scale except for the reagents 37, 53 and 72. Nevertheless, considering the percentage of explained variance it was considered opportune to maintain its integration to the scale. The result of the test of normality, it indicated not normal distribution. In balance, the observed information was considered to be consistent for the application of the AFE.

Continuing with the analysis process and in accordance with the ordinal nature of the information, an interrelations counterfoil was used polychoric for the calculation of the AFE. There was observed a satisfactory adjustment as the test KMO =. 93095 and the test of Barlett's sphericity that threw a value of 9395.5 (P.000), which suggests that the interrelations counterfoil is different from the identity counterfoil. The solution factorial obtained was constituted by four factors that there explains 44.894 % of the whole of the variance associated

with the construct in study. The factorial charges observed are over.04 (to see table 2). High co-change proportion was detected between the items and the model proposed according to the result of the GFI =. 99. As for the behavior of the residual ones a RMSR was obtained =. 0282 value that was located below the criterion of Kelley's (.0295). This result suggests that the model has good definition factorial (Hair, Thatam and Black, 1999) being robust to explain the resilience in the juvenile population.

The reliability (to see table 3) observed is an indicator of high internal consistency and a stability of the values (Landeau, 2007; Bernal, 2006; Reynoso & Seligson, 2005).

Value of.001 obtained an alpha of Cronbach of.889 and a McDonald Omega of.887, both with one p. At individual level the factors showed the following alpha values: factor 1:.875; factor 2:.868; factor 3:.794; factor 4:.875. In a complementary way, an interrelation brings in the interrelation item - whole between.419 and.578 which is an indicator of positive interrelation moderated between the item and the whole less the item.

Tabla 2: Distribución factorial del INRES.

ITEM	FACTOR	FACTOR	FACTOR	FACTOR
	Α	B	С	D
4. I recognize when I can reach my goals.	0.041	-0.020	0.277	0.425
5. I feel at ease with what I am.	0.038	-0.017	0.080	0.696
6. I am sure of my life project.	-0.080	-0.079	0.132	0.831
24. I feel guilty when I do not do what others want.	0.127	0.159	0.016	0.641
28. I am capable of autocorregirme when I commit errors.	0.048	0.687	-0.188	0.208
37. I respect the decisions of the others	0.095	0.540	0.212	-0.221
38. I support my partners in the	-0.156	0.557	0.260	0.044
53. In opposition to the stress the best thing is to laugh.	-0.099	0.127	0.644	-0.012
58. I accept easily the councils of persons foreign to me.	0.616	0.031	0.111	-0.037
60. The difficult situations strengthen	0.053	0.024	0.637	-0.000
67. Often I assume challenges that	0.820	-0.269	0.037	0.006
69. I possess skills to solve my	-0.075	0.800	0.069	-0.061
<ul><li>problems.</li><li>72. I feel that I must look for solutions</li></ul>	0.643	0.117	0.179	-0.147
to my friends problems. 77. I often take the positive side of the things.	-0.076	-0.018	0.805	0.032



In order to confirm the explored factorial model, it was estimated the AFC. The results throw that the identified dimensions develan the functioning of the population explored as for the resilience. The evidence of the adjustment oberves in the table 4.

ITEM	Average o	of Variance	of Whole-	Cronbach's	if the
	the scale i	if the scale	if element	element is el	iminated.
	the elemen	t the element	is correlatio	on.	
	is	eliminated			
	eliminated.				
<b>ITEM 4</b>	49.84	51.505	.520	.784	
ITEM 5	49.49	52.654	.484	.787	
ITEM 6	49.63	51,624	.509	.785	
ITEM 24	4 50.15	57.550	.458	.822	
ITEM 2	8 49.99	51.983	.487	.787	
ITEM 3'	7 49.64	52.086	.509	.785	
ITEM 3	8 49.98	52.210	.452	.789	
ITEM 5	3 49.74	51.805	.451	.789	
ITEM 5	8 50.59	52.497	.450	.798	
ITEM 6	0 49.94	50.824	.527	.783	
ITEM 6	7 50.96	53.472	.419	.800	
ITEM 6	9 50.28	50.355	.573	.779	
ITEM 7	2 51.01	54.858	.538	.806	
ITEM 7	7 49.95	50.309	.578	.779	
Table 4: AFC	Adjustment index				
Whole	adjustment I	ncremental	adjustment	Parsimony index	X <sup>2</sup> /gl
index	i	ndex			
GFI RM	SEA RMR (	CFI NFI	AGFI	AIC CAIC	
.976 .039	.040 .9	964 .945	.964	265.051 483.043	2,798

# SIGNIFICANCE OF THE FACTORS - DIMENSIONS THAT COMPOSE THE DEAR CONSTRUCT.

The first factor remained constituted by three reagents linked with the psychosocial confrontation. This element is present at the moment of assuming uncountable changes that the person experiences like part of its transition of life, which commonly, there are generators of stress and emotional destabilization (Wood, Bhatnagar, 2015). The research reveal that the confrontation as generator of resilience rests on the human networks formed by relatives and friends who come up before the adversity (Liu, Lib, Ling, & Cai, 2016) and increase the predisposition to confront the obstacles that inhibit the psychological normality (Gárriz, Gutiérrez, Peri, Baillés, Torrubia, 2015). Also they suggest that the subject develops strategies centred on the humor to ignore or to minimize the psychological difficulties (Çalışandemira & Tagay, 2015; Anghel, 2015). The debated induces to think that it would turn out to be incongruous to conceive the resilience removed from the confrontation. While more loudly one is in the confrontation, more steadfastness they have the subject to face obstacles of major importance, generating domains and psychosocial adaptation (Fogartya, Proudfoot, Whittle, Player, Christensen, Hadzi-Pavlovic, Wilhelm, 2015; Whittaker, McLennan, Handmer, 2015).

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The second one of the factors is shaped by four reagents referred to the process of self-confidence for the resolution of the problems. This condition is key for the estimation of the resilience, given that it involves safety in the solutions selection before the adversities, offering convictions prints for the resolution of adversity (Kapur, 2015; Catterson, Naumann, John, 2015). This factor puts in the carpet the piled up character of this dimension of the resilience, where the previous experiences reinforce and locate the belief of which it is possible to achieve successfully the problem solving in the present and in the future (Sophonhiranraka, Suwannatthachoteb, Ngudgratokec, 2015; Bose & Ye, 2015). But in spite of the social influence, there is left steadfastness of which autonomy exists in the aptitude to decide and to pass to the influence of other in the deliberations that the subject tackles (Grimaldi, Lau, Basso, 2015; Safta, 2015).

By means of this factor one bears witness to the opening towards the communication and emotional intelligence of the persons, which is an indicator of positive attitude and equanimity, in the resolution of conflicts (Middleton, Buboltz, Sopon, 2015) To be sure of the aptitude to settle problems, allows to face the complexities of the newspaper to live, using coherent strategies with the intensity and transcendence of the situation (Gárriz, Gutiérrez, Peri, Baillés, Torrubia, 2015; Choi, C. Martí, Bruce, Hegel, 2013).

The third factor remains composed by three reagents faced towards the humor and positive evaluation of the real thing. The laugh and the aptitude to abstract the positive ways of the experiences are the transverse axis of this factor. Trough humor the subject attenuates the anxiety before stressing situations, contributing with its personal self-regulation, at the time that there is optimized the physical and mental health (Turliuc, Soponaru, and Antonovici, 2013,).

A resilient person finds the comical and entertaining thing in the proper tragedy, and it is capable of laughing, of playing and of enjoying positive emotions, what in turn generates predisposition to the happiness. (Jeder, 2015). To develop certain aspects like the optimism, the creativity, promotes the self-control, before reverses that generate imbalance (Flink, Smeets, Bergbom, & Peters, 2015; Falconier, Jackson, Hilpert, & Bodenmann, 2015). The special thing indicates that the resilience as skill of confronting and becoming stronger before difficult situations needs to be able to use the resources that the person arranges. This way, the humor as ally stimulates the grace sense and generates positive emotions, which the generation of solutions facilitates before the problems that demand it (Thetford, Bennett, Hodge, Knox, and Castaway, 2015).

The last the factor links to the self-regulation. It is integrated by four reagents that explore the interior force and the capacity of acceptance of the personality in order evidence the way in which I he adapts himself before the processes through that he lives.

The control that a person exercises concerning its psychological processes is known as a self-regulation, the same one who allows recognizing the impulses, avoiding not wished behaviors (Sirois & Hirsch, 2015). The capture decisions opposite to difficulties come up by the thoughts and emotions, they activate the selective perception before the situational demand (Blalock, Franzese, Machell, & Strauman, 2015). Therefore the self-regulation implies handling stages that they interfere with the activities to be executed (Eiden, Godleski, Schuetze, and Colder, 2015) since to be known if the same it allows to increase the aptitude to get over before adverse events experiencing well-being (Rui & Cross, 2015). In accordance with the stated thing, the personal control before the misfortunes, allows to evade possible stressing situations that determine the control of impulses, the serenity in the decision making (So, Achar, There Are, Agrawal, Duhachek, & Maheswaran, 2015); the identification of the irrational ideas that finally activate the imbalance and insecurity in human beings (Milkoreit, Moore, Schoon, & Meek, 2015).

The composition of the resilience from the latent variables that structure it bears witness to the presence of a multidimensional concept that limits the psychosocial adjustment of the subject and its possibility of self-fulfillment. Every day we are linked by the adverse thing for being a polarity of the existence and a component of the fluctuation of the balance, from there that to take conscience of the human conditions to confront it is a mental health guarantee.

## CONCLUSIONS

The study was allowed by the generation of an inventory of resilience constituted by 14 reagents that there explains 44.894 % of the variance associated with the construct. The solution factorial opposing identifies four factors that are: psychosocial confrontation, self-confidence in the problem solving, humor and positive evaluation of the real thing and self-regulation of me. This model is exact by virtue of the realized statistical



evaluation. As for the reliability, the inventory showed an alpha of Cronbach of 889 and a McDonald Omega of 887, both with one p value of 001.

This study offers a tool that allows the research of the factors that promote the resilient behavior in young university students in order to impel its academic performance and the ripeness that like professional need. It also opens processes of research linked to the interaction of the resilience like a variable that determines the success in the different areas of development where the population unrolls study object.

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# **Revisiting Pedagogy: What about Pedagogy 3.0?**

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## ABSTRACT

This paper aims to reconstruct the understanding of academics on pedagogy from the perspectives of a Malaysian academic. In Malaysia, the understanding on pedagogy has reached the stage where acceptance of Pedagogy 3.0, including pedagogy, andragogy and heutagogy makes an impact on the education landscape in Malaysia. The Malaysia Education Blueprint (Higher Education), launched in 2016, highlights the importance of Pedagogy 3.0 through its ninth initiative, which is Globalised Online Learning. As a conceptual paper, the methodology adopted is content analysis of literature review on the evolution of pedagogy. The main question addressed in this paper is whether despite the various relabelling of pedagogy, what impacts do these have on achieving academic excellence? In preparing the global leaders, perhaps academics must step back and out of the loop in order to get the broader view of what is necessary, and what is luxury for the learners to go through during their learning processes.

## **INTRODUCTION**

For young academics, it may be disheartening and overwhelming when they realise that learners have difficulties in understanding the lessons of the day. Especially for those without any teaching certificates or background, the thought of learners struggling and giving up may hinder these young academics from achieving their potential. What is actually the issue that must be understood by these young academics?

To begin with, this perplexing scenario may not be faced by younger academics only. To senior or experienced educators too, sometimes learners find it difficult to follow their lessons. Amongst the critical skills that must be equipped to all academics is pedagogy, and it is always associated with the methods or practice of teaching children. According to Murphy (1996), pedagogy is a term widely used in educational writing but all too often its meaning is assumed to be self-evident.

This paper aims to reconstruct the understanding of academics on pedagogy. In Malaysia, the understanding on pedagogy has reached the stage where acceptance of Pedagogy 3.0, including pedagogy, andragogy and heutagogy makes an impact on the education landscape in Malaysia. The Malaysia Education Blueprint (Higher Education), launched in 2016, highlights the importance of Pedagogy 3.0 through its ninth initiative, which is Globalised Online Learning. As such, each public higher education provider is expected to produce at least three Massive Open Online Courses (MOOCs) per year until 2020. This is where, the significance of heutagogy is highlighted.

As a conceptual paper, the methodology adopted is content analysis of literature review on the evolution of pedagogy. The main question addressed in this paper is whether despite the various relabelling of pedagogy, what impacts does the evolution make for achieving academic excellence? In preparing the global leaders, perhaps academics must step back and out of the loop in order to get the broader view of what is necessary, and what is luxury for the learners to go through during their learning processes.

Before further discussion is done, it is imperative that the outline of this paper is presented. The paper has four sections including this introduction. Next, the second section further discusses the birth of pedagogy, including its literature to further understand what pedagogy is. The third section examines the evolution of pedagogy, and argues for the importance of understanding pedagogy as part of teaching and learning repertoire. The last section concludes the paper with two suggestions on understanding and revisiting pedagogy.



#### THE BIRTH OF PEDAGOGY

Pedagogy is a small word with a massive impact in education. What constitutes an effective pedagogy? This section revolves around the historical account of pedagogy. It is argued that the founder of pedagogy is Herbart, a German philosopher. Herbart's educational philosophy concentrated on the relationship between personal development and its influence on society. This suggests that learners realise their potential only when they are able to be productive citizens of the nation. Being a Mathematician, Herbat argued for a dominant role in the area of the progressive trend of the education, because without strong recommendations, the education reform in the United States would not possibly be developed (Somr & Hruskova, 2014).

Herbart (1906) promoted five formal steps in teaching, which were translated into a practical teaching methodology,

- a. preparation relating new material to be learned to relevant existing ideas (memories) to stimulate the learner's interest (prepare learners to be ready for the new lesson)
- b. presentation presenting new material in the form of actual experience of concrete objects (present the new lesson)
- c. association comparison of the new idea with existing ideas to find similarities and differences, and thus implant the new idea in the mind of the learner (associate the new lesson with ideas studied earlier)
- d. generalisation procedures designed to take learning beyond perception and experience of the concrete into the realm of abstract concepts (use examples to illustrate the lesson's major points)
- e. application using the newly acquired knowledge so that it becomes an integral part of the life of the learner (test learners to ensure they learned the new lesson).

Herbart's ideas were widely adopted in Germany and also the United States, translated into the simple five-step teaching method that became the basic pedagogical practice in the 19<sup>th</sup> century. By the 20<sup>th</sup> century, however, the steps had become mechanical, and Herbart's underlying ideas on ethics, psychology, and aesthetics had been forgotten. In their place, new pedagogical theories, such as those of John Dewey in the United States, which freed the child from what had become a controlled learning environment, grew in popularity. Although his teaching methodology was overtaken by new ideas, Herbart's institution of pedagogy as an academic field has remained. The idea of a science of education, including psychology as a source of information about the nature of the learner as well as the learning process, has continued to advance teaching methods. Refining Herbart's ideas, according to Dewey, there were four key educational issues on a reformed educational system. These continue to provide the basis of critiques of and discussion about contemporary education.

The first key issue proposed by Dewey was the value of learners' experiences. Dewey (1933) believed that the way learning occurred inside the formal educational setting should not be isolated from learning achieved elsewhere. He advocated a continuity of the process of learning between settings and viewed each learner's greatest asset as being his/her direct, personal experience that must not be ignored or thrown away in the process of learning. Dewey further proposed the principle of learning through personal experience that rested on two factors - internal and external experiences. For Dewey, education was a re-construction of experience that continuously unfolded learners' potential. In addition, Dewey's (1916) second key educational issue was that learning should be by doing. This meant giving more independence and active roles to learners in their learning. Learners were to describe the construction of their own learning by using their previous knowledge or experience. In other words, the role of active engagement was being advocated. Dewey (1916; 1938) noted that traditional schools kept insisting on telling learners what they needed to learn, despite research clearly demonstrating that learning by telling did not work and learning by doing did. Following Dewey, education should be democratic - it should be experiential, in the sense of engaging the interests of the learners; and it should be reflective, in encouraging learners not just to gather facts but to make connections and to critique knowledge. Thus, Dewey believed in the engagement of learners in the learning process through 'doing' and not just listening.

The third key educational issue promoted by Dewey was purposeful learning. For what purpose was the content to be learnt? Dewey (1938) forcefully stressed the need for activities to be linked cumulatively, defining educative experiences as those that gave rise to the learners' need to gather more facts, become more skilled and use lessons learnt in one experience as the basis for future experiences. He termed this a 'continuous spiral.' Also, Dewey proposed that when learners had a clear and strong purpose for learning, they became more committed and able to participate actively in the learning sessions. The last key educational issue stressed by Dewey was the importance of critical thinking in the education system. Dewey (1933) proposed that in order for learning to be truly effective, it must inculcate reflective thought, or what was referred to in contemporary education today as critical thinking. He further defined reflective thought as an active and persistent process that was able to support individuals' opinions. As this was an individual process, each learner would construct his/her own opinions and critically reflect on those opinions. Furthermore, Dewey elaborated that there were two important elements of reflective thinking. The first element was "a state of perplexity, hesitation and doubt" and the second element was "an act of search or investigation directed toward bringing to light further facts which serve to corroborate or to nullify the suggested belief" (Dewey 1933). By these two elements, Dewey suggested that in order to be reflective or critical thinkers, learners should have doubts or question ideas that they just encountered. They must not believe or merely accept the ideas without trying to challenge their validity. The next step was to analyse the ideas and try to find support to accept or reject them. Thus for Dewey, critical thinking or reflective thought helped learners to construct and build new knowledge, making them aware that they must be active in questioning and challenging new information.

Dewey's interpretations of learning have proven to be useful in the modern world of education. It is in the 21<sup>st</sup> century that scholars such as Hickman (1990; 2001) and Phillips (2002) have realised that what Dewey stated as the critical issues in education are indeed valid, and these issues continue to form the basis of effective pedagogy. This is because when Dewey began his philosophising on education, many misunderstood his ideas of progressive and reflective education. Some even understood Dewey's ideas as only having relevance to children and their education. Nonetheless today, it has become increasingly obvious that Dewey's writings were not limited to children's education only.

Given the above analysis of pedagogy, there now exist several branches of pedagogy; some can be argued as the extension of the other, and some are viewed as something totally different. Despite this, all of these 'gogies' have something critical in common. It is the fact that these 'gogies' emerge as ways to facilitate teaching and learning, especially when learning itself is a dynamic process, and they are the platforms to ensure learning is achieved. The next section examines the other 'gogies' in detail.

## FINDINGS AND DISCUSSIONS: THE EVOLUTION OF PEDAGOGY

Despite the claim that Dewey's ideas on learning does not only cover children's education, the term 'andragogy' became popular due to the fact that many adult learners return to learning whilst working. Because they were not able to further their studies during their teenage years, it is argued that since they have had the experience as working people, their expectations and ways of learning are different from that of teenagers or children. The history of andragogy started in Germany when a high school teacher, Alexander Kapp described learning as a necessary lifelong process in his book *Plato's Educational Ideas* in 1833. Although he did not develop a theory of andragogical principles, Kapp argued that self-reflection, intrinsic motivation and higher self-efficacy is the purpose of human life and learning happens not only through academics but also through life experience. 135 years later, in 1968, Malcolm S. Knowles developed the theory of andragogy, and published an article entitled *Andragogy. Not Pedagogy*, which established him as the leading theorist on adult education in the United States (Reischmann, 2011).

The basic characteristics of andragogy, according to Knowles et al. (2005), include,

- a. adults need to comprehend why they need to learn something. The information has to have meaning for their lives and be of some applicable benefit.
- b. adults are self-directed and have a deep psychological need to be acknowledged by others as capable of self-direction.
- c. adults arrive in learning scenarios with a wider variety of knowledge and experience than children. This previous knowledge can be of assistance in a new learning situation but can also be a hindrance if it results in the individual being less open to new concepts. In either case, adults expect their prior experience to be acknowledged.
- d. adults are task-centred learners. They become ready to learn subject matter based on the need for certain learning in order to cope with their lives.
- e. although adults respond to external motivators such as promotions or higher salaries, they are more motivated by intrinsic factors, including self-esteem, job satisfaction and quality of life.

Knowles further elaborated on andragogy by suggesting four main principles. These are (a) adults need to be involved in the planning and evaluation of their instruction; (b) experience (including mistakes) provides the basis for the learning activities; (c) adults are most interested in learning subjects that have immediate relevance and impact to their job or personal life; and (d) adult learning is problem-centred rather than content-oriented (Kearsley, 2010). These principles suggest that the role of experience in andragogy is massive (and these also reiterate what Dewey had proposed as his first key educational issue, which is on the importance of leaners' experience). It is inevitable that adult learners know what they need because their experience points them to the direction that they seek. At the same time, based on their prior experience too, they want to learn something that is of the utmost relevance to them so that they can use the new knowledge for facilitating their existing job. Because of this too, they want to be able to solve problems at their workplace, which suggests that the experience tells them what is important, and what is not.

The term andragogy is akin to adult education for some scholars. For European countries such as Poland, Germany, the Netherlands, Czechoslovakia, Russia, Yugoslavia, and other central and eastern European countries, the term andragogy is better understood compared to adult education which is normally used by the British and Americans (Draper, 1998). Merriam (2001) argued that when Knowles introduced andragogy to North American adult educators, self-directed learning also emerged as another model to help understand the differences between how adults and children learn. In fact, Knowles (1975) also wrote a book about self-directed learning. It must be emphasised that the first assumption underlying Knowles's view of andragogy is that learners become increasingly self-directed as they mature. In addition, when applying andragogy in classroom learning, the methods of instruction, either direct or indirect, are based on the tasks. A more direct instruction will be employed if an unknown concept is introduced during the lessons. The most critical aspect is that the learners need to know why the concept to be learned is important in order for them to remain motivated.

From andragogy and self-directed learning, a new form of pedagogy is borne. Heutagogy, a form of selfdetermined learning with practices and principles rooted in andragogy, has recently resurfaced as a learning approach after a decade of limited attention (Blaschke, 2012). In a heutagogical approach to teaching and learning, learners are highly self-directed and self-determined. Importance is put on the development of learner capacity and capability with the goal of producing future workforce who is well-prepared for the challenges and complexities of the 21<sup>st</sup> century's workplace. Although heutagogy appears to be an extension of andragogy, there are, of course, some differences that distinguish these two 'gogies.' One of the differences between andragogy and heutagogy is that heutagogy further expands upon the role of learner agency in the learning process. Thus, the learners are seen as, "the major agent in their own learning, which occurs as a result of personal experiences" (Hase & Kenyon, 2007). To ensure successful implementation of heutagogical approaches to teaching and learning, a number of design principles for learning can be applied, no matter what the context is (Dick, 2013; Hase & Kenyon, 2013a, b; Kenyon & Hase, 2013). These include,

- a. learners need to be involved in negotiating what and how they learn throughout the design and learning process.
- b. curricula should be flexible and take into account learners' questions and motivations and how thinking shifts as a result of things they have learned.
- c. learners and the teacher need to work together to negotiate how learning outcomes will be assessed. Evaluation could also include forms of participative (self- and peer) evaluation, allowing learners to learn from each other and through self-reflection.
- d. the role of the teacher is to guide the learner, providing formative feedback that is personalised according to the learner needs.
- e. the learning environment needs to incorporate opportunities for learners to explore and reflect on what they have learned and how this new knowledge can be optimally utilised.

Some scholars argue that due to the changing demands in the industry, graduates must be well-equipped with various skills especially communication and critical thinking skills. This is where heutagogy comes into significance. This is because moulding "competent and capable learners is critical to life in the rapidly changing economy and cultures that characterise postmodern times" (Anderson, 2010). By incorporating heutagogical practice, academics are able to prepare learners for the workplace and for becoming lifelong learners, as well as to foster learner motivation by cultivating learners who "are fully engaged in the topic they are studying because they are making choices that are most relevant or interesting to them" (Kenyon & Hase, 2010).

Because self-determination is the driver for learning, heutagogy is best reinforced with digital technologies. There are six elements in the heutagogical approach that are well-suited to be supported with technologies. These are (Blaschke & Hase, 2016),

- a. explore essential to heutagogy is the element of exploration. Learners must be given the freedom and opportunity to explore various sources of knowledge. Technologies that can support exploration includes the Internet (Google or other search engines).
- b. create another important design element of heutagogy is giving the learner the freedom to create. This can be achieved using a variety of learning approaches, for instance, writing and drawing. Applications such as Padlet or WordPress can help in this creation process.
- c. collaborate collaboration aims to provide the kind of environment where learners can learn from each other. Googledocs is a popular application to encourage collaboration amongst the learners.
- d. connect networks and connections are keys within heutagogy, since learners learn through these connections. It is easy to connect between learners today since social media such as Twitter, LinkedIn or Facebook provide comprehensive services on expanding network.
- e. share once learners have started connecting, it is only apt that they start sharing. Numerous Web 2.0 tools are available for this purpose, such as SlideShare and ResearchGate. Sharing information allows leaners to keep track, learn from each other's discoveries and experience, provide feedback and get to know others with similar interests.
- f. reflect lastly, reflection allows for improvement and consolidation of new and old knowledge. This is where there is potential for new learning to occur and previous learning to be consolidated. Tools such as WordPress, Facebook or Twitter can be used to reflect, and academics can then provide appropriate feedback accordingly.

To sum up the critical aspects of pedagogy, andragogy and heutagogy, Table 1 below takes into consideration the key strengths of each 'gogy.' These three 'gogies' are also known as Pedagogy 1.0, Pedagogy 2.0 and Pedagogy 3.0, responding to the term pedagogy, andragogy and heutagogy respectively. It must be emphasised that military pedagogy is added for reasons explained in the next two paragraphs.



	Pedagogy: Teacher-	Andragogy: Self-	Heutagogy: Self-	Military Pedagogy:
	Led Learning	Directed Learning	Determined Learning	(Blended Learning
	Pedagogy 1.0	Pedagogy 2.0	Pedagogy 3.0	Pedagogy 1.0-3.0)
Dependence	Learners are	Learners are	Learners are	Learners are
	dependent. The	independent. They	'problem finders.'	independent and
	teacher determines	strive for autonomy	They know their	'problem solvers.'
	what, how, where and	in learning to arrive	destination and	They listen and
	when anything is	at a destination	become	follow instructions
	learned	determined by others.	interdependent on	well but are able to
		They are 'problem	those who can help	question and probe
		solvers'	them determine the	further for more
			route	
Reasons for	Learners place trust	Learners seek	Learning is not	Learning is sequential
Learning	in the teacher and the	guidance/mentorship	necessarily sequential	in order to allow for
	efficacy of linear,	but aspire to increase	or linear. Learners	progress. Learners
	sequential learning.	responsibility for the	accept full	aspire to increase
	Learners take little or	direction of their	responsibility for	responsibility as they
	no responsibility for	learning	their learning,	become more familiar
	their learning		welcoming	with learning and
			challenges and	working environment
			serendipity	
Focus of	Learning is subject-	Learning is goal-	Learners are enquiry	Learning is goal-
Learning	centred and focussed	driven, focussing on	driven – they take a	driven on standard
	on prescribed	tasks which allow for	long-term view of	curricula. Learners
	curricula	cross-disciplinary	their learning,	are enquiry driven in
		thinking and	seeking further	order to become
		autonomy	complexity and	critical and analytical
			uncertainty	learners
Motivation	Motivation derives	Motivation is	Motivation lies in	Motivation is both
for	from	intrinsic – leaners	experiencing 'flow'	intrinsic and
Learning	external/extrinsic	enjoy the boosts to	and knowing how to	extrinsic. Learners
	sources such as	self-esteem that	learn. Learners seek	enjoy self-discovery
	parents, teachers,	comes from	out unfamiliar	and new found
	sense of competitions	successfully	situations and the	knowledge and they
	etc.	completing	gaining of 'adaptive	also are driven by
		challenges	competencies'	sense of competitions
				and other people
Role of	Pedagogue – designs	Facilitator – sets	Coach – brings	Mentor (Murabbi) –
Academics	the learning process,	tasks but encourages	together opportunity,	becomes a role model
	suggests and provides	diverse routes to	context, external	for knowledge and
	materials deemed	solutions. Pursues	relevance and	personality. Designs
	effective at achieving	meta-cognition in	extended complexity.	the learning process,
	desired outcomes	learners	Fosters a culture of	set tasks and
			collaboration and	encourages
			curiosity	collaboration and
				sharing of ideas

## Table 1: Comparison between Pedagogy, Andragogy, Heutagogy and Military Pedagogy

Source (Gerstein, 2016; the author, 2017)



As the author works in a military learning environment, another branch of pedagogy, considered under military sciences (see Toiskallio, 2003), must also be examined. Military pedagogy originates from European military institutions that are concerned with the education and training of their military personnel. Military pedagogy can be defined simply as the education and training for military purposes, and the education and training must be conducted in a military learning environment (Falk, 2008). The term and practices of military pedagogy is not *popular* in the Asian region. Nonetheless, it is pertinent to compare and contrast the 'gogies' in education as one 'gogy' may not fit one learning environment.

Can military pedagogy be considered part of the pedagogy revolution? The author opines that military pedagogy belongs to the continuum of this evolution. The reasons for this are twofold. Firstly, as another branch of pedagogy, it has been mentioned earlier that different learning environments and purposes of learning require different approaches to teaching and learning. Because military institutions rely heavily on the concepts of chain-of-command and leadership, the approach and instruction methods require ones that permit learners to be articulate whilst at the same time respect the academics and fellow learners. These academics can be military officers in and outside of classroom learning. Secondly, military pedagogy is associated with academic achievement of military personnel, and not so much on the military training. Most of the time, academic and military training run concurrently, and this puts learners into a tough situation in which they have to balance two priorities. Given all these, the author argues that positioning military pedagogy in the pedagogy evolution is appropriate, as can be observed in Table 1.

## CONCLUSIONS

What can be discerned from the analysis and discussion in the previous two sections? Looking at the question addressed earlier on the impacts this evolution has on academic performance and excellence of learners, it can be argued that as the educational landscape changes, so does the 'gogy' that must be adopted for classroom learning. It is expected that not all academics would know about these branches of pedagogy. Notwithstanding this, the knowledge on each branch may ensure successful teaching and learning, especially when these academics are aware of their roles and the learners' motivation for learning. Often, it is found that learners lose focus in the middle of the semester simply because 'there is nothing new' about the teaching approach. Today's generation of learners are different from 10 or 20 years ago. They are fast paced learners and are able to explore new things on their own with the assistance of digital technologies. Most of these learners are attached to their gadgets, and thus the academics must know how to utilise this situation to their advantages. For example, they can use Twitter to ask questions, and then ask the learners to provide feedback, orally or by tweeting their answers. The classroom learning then, may become interactive and active.

To conclude, it is high time that the academics revisit the meaning and implications of pedagogy, andragogy, heutagogy and military pedagogy (for those at the Defence Universities or academies). There are two suggestions on enriching the academics' teaching repertoire. These suggestions can be taken up immediately. First, extensive research must be done on finding the best 'gogy' that suits learners of the day. It must be emphasised that learners' acceptance may vary and may change over a period of time. Therefore, the research must be dynamic in nature, and academics must be flexible to suit the learners' needs. Second, frequent exchange of ideas from counterparts all over the world may open up possibilities for physical exchange programmes, or if financial support is not available, video conferencing or Skype is good option. Benchmarking best practices from other countries is a sign that academics and higher education providers are ready for changes, which are inevitable!

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# **Roma Identity and Education- Comparative Research**

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## ABSTRACT

This paper is a report of studies conducted by the authors in the Roma community in the Czech Republic and Slovakia. After a brief introduction and characteristics of the researched group, the theoretical basis of the research and a methodological approach was presented. The project was supposed to be an attempt to show the difference with Roma education and the dominant community in their country of residence. The research objective of the project would be to identify Roma perceptions of education and school duty. Identify and understand the relationship between the Roma identity and their relation to education and participation. Three areas were analyzed: identities, culture and education. The identification of their identities, their participation in culture and the education of the culturally dominant group are indicated. The conclusions show the current situation of the Roma in these areas and possible recommendations or solutions for the future.

## INTRODUCTION

Being the most numerous minority group in Europe, above all in Central Europe, Roma/Gypsies are, at the same time, the least known community. There are 6-12 million Roma dispersed around Europe with two-thirds living in Central and Eastern Europe. The whole Europe should try to get to know them in order to understand them. The surveys problem seems to be essential for the whole region of Central Europe.

Theoretical consideration concern: Romanis, ethnic identity; integration and social (cultural) assimilation; multicultural education; minorities' culture; social changes; transformation; globalisation. There are introduced: the characteristic of Romanis ethnic group and the situation in which Gypsy people are now. There are also described conditions of participation of Romanis/Gypsies in culture and education of majority. The authors presents the project, which would be an attempt to show the differences in the understanding of the education by the Roma and the dominant community in their country of residence. The aim would be to identify a formal relationship to the educational system and own group. The authors describes the elements of the identity of the Roma. It also indicates a possible approach to the use of theoretical and empirical research suggests this.

That were monographic surveys with the usage of analysing technique of documents and literature but also qualitative techniques (narration interview, interwiev, active observation). The research trip (internships) to Czech Republic and Slovakia were enable to gather required knowledge that would be taken from archives and libraries (teaching plans and programs – official and alternatives; governmental plans and specific law regulation; documents about educational institutions, associations, organizations and social movements that are engaged or take part in Romanis/Gypsies' education). The interviews with Romanis/Gypsy leaders and people engaged in Romanis/Gypsy education were also play vital role here.

## **ROMA ETHNIC IDENTITY**

In the text consistently tried to use the name "Roma" in terms of not its ethnic or rather political significance. Despite some negative language associations, the name "Gypsies" is still used for reasons of historical or substantive correctness. Without forgetting the group diversity of the described community, we use the name "Roma" in its political meaning, thus covering all Roma groups. We also know that some of them do not use this ethnic name.



Their ethnic boundary, based on the above dichotomy, is additionally regulated by Gypsy purity laws and expressed by the three following models (Mirga, Mróz, 1994, pp. 269-270): The first model is based on the contrasts "pure-impure" (*Romanipen-Gadjipen*) (Hancock1992). Name gadzio, sing. (gadzie plural.) – stranger, no-Roma. Romanis are pure since they know how to avoid contamination. Non-Gypsies are impure due to their constant violation of the Mageripen code (marks borders of conduct permitted among Roma people). According to the second model, contamination relates only to the Gypsy community and is respected only within the Romani group. The Roma perceive the inappropriate behaviour of Gadje whilst considering the non-Gypsy population as neutral. People who can lead to the contamination of the Roma are for example: midwives and doctors. The contamination theory plays an insignificant role according to the third model. Non-Gypsies are portrayed more as evil and dangerous rather than impure. Rom, on the other hand, is depicted as good and wise.

It is crucial that Roma lack a collective ethnic identity which only now is being reinforced by a small group of Gypsy elite. Their ethnic identity relates mainly to the non- Gypsies (Gadje). Their ethnic boundary, based on the above dichotomy is additionally regulated by Gypsy purity laws. The first model is based on the contrasts "pure-impure" (Romanipen-Gadjipen). Romanis are pure since they know how to avoid contamination. Non-Gypsies are impure due to their constant violation of the Mageripen code. The contamination can occur on different levels, depending on a Roma group.

American romologist-Matt Salo (1979, pp. 73-96), listed the below criteria distinguishing the Roma from the Gadje: The first one- universal- characterizes all the Gypsy groups. It is the Gypsy kindship – membership inherited naturally, as a consequence of birth to Gypsy parents. It reflects a status of an individual in a social stratum. One can also become a member of a Gypsy community via brotherhood and mixed marriage. A child being born in a mixed marriage enjoys the full rights of a Gypsy. The second one reflects the contamination concept in the Gypsy culture, the concepts of appreciation and respect. Rejection of Gadje by the Gypsy community is caused by their disrespect of Romani cultural standards. The third criterion is related to the Romani language which symbolically separates the Roma from the Gadje who cannot speak the Romani language. The fourth one reflects the norms, resulting from a group structure and the links between its members, which exclude non-Gypsy from the social organization of the Roma community. The fifth criterion constitutes the Gypsy economic business activity with the Gadje considered fair game for exploitation. The sixth one reflects the external distinctive anthropological features perceived by the Roma as Gypsy, such as: outfits, specific gestures and so forth.

#### **IDENTITY BEHAVIOR THEORY**

A theoretical concept that would allow to systematize the determinants of the Roma identity and could be applied in the description of its subsequent areas is Tadeusz Lewowicki's (2001, pp. 161-164) Identity Behavioral Theory (TZT). Especially in a comparative context with the majority group, as Tadeusz Lewowicki claims that concentration on a chosen minority community deforms reality and makes it difficult to reach general patterns, conditions, relationships (Lewowicki 1995). Referring to the criteria described above in the TZT, the first three areas appear to be relevant to Matt Salo's first, second and third elements, but also for the fourth and sixth. Thus, they concern the determinants of historical fate, the distinctness of the institution, culture, language, customs, transmission of tradition, biological and racial categories, personality traits, stereotypes. The fifth element of the Roma identity seems to correspond to the fourth TZT area, for it concerns the economic sphere, the standards of life, the styles of economic activity. It is also important to refer to the Fifth and Sixth TZT areas, but this will require in-depth study of the proposed issues.

The social and cultural identity of the Roma is being transformed, which may be reflected in their increasing participation in the socio-economic and political life of the countries of residence. They are increasingly adapting to continuous change, which does not matter to their identity. Often among the Roma comes to doubling, tripping identity (eg. Lovar - Rom - Pole or Polish Roma - Roma, European, Citizen of the World). Also, Jerzy Nikitorowicz assumes the possibility of many dimensions of identity. Indicates the ongoing process of shaping and operating in three dimensions: Identity inherited and acquired, Identities of roles and challenges, Identity felt and realized (Nikitorowicz, 2009, p. 378).



#### SHORT CHARACTERISTIC OF ROMA GROUPS

European Roma, for centuries, have been faithful to their traditions and cultural heritage. This is reflected not only in their cultivation of the Romani language, maintenance of Romani customs and active participation in the lives of ancestral and tribal communities but is also manifested in the group exclusivism and compliance with solely Gypsy communal forms of organization, systems of rules, code of conduct rather than with the mainstream - non-Gypsy structure. Similarly to the representatives of majority populations, the Romanis are living in times of constant social changes and the development of civilization. As a consequence, their identity has undergone various transformations provoked by globalization, European integration, political system transformations, educational reforms and more active participation of Romani students in the schooling process. The government programmes, for the Roma community not only in Czech Republic and Slovakia but also in other countries, focus on amelioration of the Romani educational situation and their occupational development. The Romani identity is not closed since it has been undergoing, to a certain extent, transformations similar to the changes transforming the identities of other communities.

Romanis are surely a heterogeneous ethnic group. The division into subgroups influences the Roma's comprehension of the surrounding environment. It can be easily noticed that tribal identities are being replaced by a broader concept of Romanihood - attempted to be defined in national categories. The Romani community has been subject to social transformations as a result of the Gypsy elite's concerted attempts to create a homogenous Romani identity. Romani inner integrity embodies the common elements of Roma identity and similarities between the Romani subgroups. The newly deconstructed identity is vital not only for the Romani elite. Borrowing solely symbolism from its predecessors aids the self-identification process of individuals or whole groups through the common language, tradition and cultural heritage. Gypsy group cohesion and their social behaviour are strictly regulated by the highly developed inner system of social control outlined in the code of conduct and represented by Gypsy institutions "the Romani traditional jurisdiction" (the rules of mageripen, romanipen, manusipen). Transgression of taboo mageripen leads to tainting. Romanipen marks the border of ethnicity, it is an interpretation of Roma tradition and is valid only inside community. Manusipen is humanity, preserving Roma moral values romanipen. There are different institutions within various Roma groupings. Some institutions are more democratic, represented by a kris (group of persons) in collective decision taking. The others are ruled by one leader (Sero Rom, Jonkaro) (Ficowski, 1985, pp. 175-199). Inner relations and social stratification are regulated not only by the hereditary caste status but also by personal traits of an individual person. The diversity of Romani ethnic identity depends on the length and intensity of the assimilation process conducted towards particular representatives of the Romani minority group. Most of the Roma communities are characterized by a high spatial mobility. Their family home - a cradle of Gypsy culture, place of meetings, Gypsy fortress - and oral transfer of customs, history and cultural traditions to the younger generation (oral culture), played an integral part in the preservation of Romani cultural traditions. The Romani language is still spoken in the traditional Gypsy home.

The Romanis form one cultural group around the world that is internally divided. The division occurred as a result of fundamental clan and tribal differences, traditional and modern nomadic practices, Gypsy dispersal and settlement in different countries. Romani existence next to the mainstream populations, with distinctive cultural traditions, religion, socio-political characteristics also influenced the Romani identity. However, Roma still remain largely unknown by the majority population. Their distinctness is reflected by group exclusivism and cultural ethnocentrism. Despite their subdivisions, Romani people have succeeded in retaining their inner integrity. One of its characteristic features is endogamy, the practice that facilitated the maintenance of Romani homogeneousness. Furthermore, Roma integration into a host society or even into the global population might lead to the creation of a universal Romani identity. The Romanis might also skip the phase of national identity formation and adopt a broader European identity or even head towards New Tribalism - the phenomenon which embodies the return to traditional elements of Romani identity.

Roma people divisions are also visible in Czech Republic. We can divide them in five different subgroups which considerably vary in numbers. The first three are newcomers who settled during the migrations after 1945. The first and biggest group is Slovakian Roma, otherwise called Servika Roma, Slovenska Roma, i.e., c.a 65–75% of all Roma people. Such great amount of Slovakian Roma in Czech Republic is a result of many-years migration to Czech Republic in search of jobs and place to live in Czechoslovakia time. The second group are Hungarian Roma, ethnonym Ungrika Roma. They are 15–20% Roma in Czech Republic. Wallachian Roma – Olaši (Vlachi, Vlachika Roma) are a small community. There are 10-15% in the population of Czech Roma.



They came from the territory of present-day Romania. The least numerous group are Czech Roma, sometimes divided into Czech and Moravian Roma and German Roma – Sinti. Both communities had been living on the territory of Czech Republic before the WW II but the majority were murdered by German Nazis. Czech Roma are descendants of several hundred people who survived the extermination. They are mostly assimilated group, especially as far as language is concerned.

In present-day Slovakia we also can divide Roma society on sub-groups. Similar groups inhabit territory of Czech Republic. The biggest community are Slovakian Roma people. Distinct line of the division and Olaši Roma manifests itself on different level of upholding tradition and language and also different ways of living and dwelling. Other groups have little percentage of Roma people in Slovakia.

Up to the present, no reliable data have been gathered which would show a considerable fluctuation in the size of Roma population and include a thorough analysis of their characteristic demographic features.

 Table1. The Roma population in the Czech Republic (the 20th and 21st century)

Year	Roma population	
1930	227 <sup>y</sup>	
1947	16 752 <sup>x</sup>	
1970	60 279 <sup>y</sup>	
1980	88 587 <sup>y</sup>	
1989	150 000 <sup>y</sup>	
1991	32 903 <sup>y</sup>	
	11 746 <sup>y</sup>	
2001	150 000-300 000 <sup>x</sup>	
2011	5 155y 150 000-300 000x	

Key:

<sup>X –</sup> demographic estimates

<sup>y</sup> - census data/official data

References: Z. Barany, *The East European Gypsies. Regime Change, Marginality and Ethnopolitics.* Cambridge University Press 2002. p. 126; K. Kalibová, *Romové v Evropě z pohledu demografie,* "Demografie" 2001, No. 2, pp. 125 – 132; J. Langhamrová, T. Fiala, *Kolik je vlastně Romů v České republice?* "Demografie" 2003, No. 1, pp. 23 – 32; *Sčítání lidu v Republice československé ze dne 1. prosince 1930*; *Sčítání lidu, domů a bytů 1991.* Základní údaje za republiky, kraje a okresy – Česká republika; *Sčítání lidu, domů a bytů 2001;* Český statistický úřad. http://www.czso.cz; G. Šamanová, *Národnost ve sčítání lidu v českých zemích,* http://www.cvvm.cas.cz/upl/nase\_spolecnost/100023s\_Samanova-narodnost.pdf (24 July 2017).



Year	Roma population	
1930	31 188 <sup>y</sup>	
1947	84 438 <sup>y</sup>	
1970	159 275 <sup>y</sup>	
1980	199 863 <sup>y</sup>	
1989	25 3943 <sup>y</sup>	
1001		
1991	89 920 <sup>y</sup>	
2001	350 000-500 000 <sup>x</sup>	
	105 738y	
2011	350 000-500 000x	

Table 2. The Roma population in Slovakia (the 20<sup>th</sup> and 21<sup>st</sup> century)

Key:

<sup>X –</sup> demographic estimates

<sup>y</sup> - census data/official data

<sup>1-</sup>77 269 persons declared they spoke Romani language at home.

References: Z. Barany, op. cit., p. 126; K. Kalibová, Prognóza romské populace v ČSFR do roku 2005, "Demografie" 1990, No. 3, pp. 219 – 223.G. Kozmová, Rómsky problém na Slovensku, "Slovenská politologická revue" 2004, No. 4; B. Vaňo, E. Haviarová, Demografické trendy rómskej populácie, [in:] Čačipen Pal o Roma. Súhrnná správa o Rómach na Slovensku, ed.by M. Vašečka, Bratislava 2002, pp. 475-502. B. Vaňo, Demografická charakteristika rómskej populácie v SR, Bratislava 2001.

Table 3. The Roma	population i	n the Czech Re	public and Slovakia	- comparative overview

Data	The Czech Republic (2001)	Slovakia (2001)
Census data	11 746	89 920
	(0, 11% of total Czech population)	(1,65% of total Slovak population)
Demographic estimates	150 000-300 000	350 000-500 000
	(1,42%-2,84% of total Czech	(6,42%-9,16% of total Slovak population)
	population)	
Overall number of Roma		
population	10532770	5455000

Source: Z. Barany, op. cit., p. 126; E. Davidová, Romano drom. Cesty Romů 1945–1990. Zmeny v postaveni a způsobu života Romů v Čechách, na Moravě a na Slovensku. Olomouc 2004. pp. 24-49; B. Vaňo, E. Haviarová, op. cit., pp. 475-502.

## **ROMA EDUCATION**

Romani education (Romani ethnic group education and so forth) relates mainly to the educational initiatives of the host countries. The activities that comply with the official education system applicable in a particular country include schooling and education of Romanis, educational activity of Non-Governmental Organizations, other educational institutions, Romanis and their minority associations. The programmes also comprise all the initiatives familiarizing the mainstream population with the facts related to the Romani lifestyle and situation.



The above understanding of "Roma education" fully reflects the concept of intercultural education and it cannot be restricted solely to the educational programme carried out but Romanis themselves for their own ethnic group (Kwadrans, 2011, p. 7).

Roma people are the most defenceless group and the most unwanted at the same time in the midst of European Minorities. We could observe: growing pauperization some part of Romany, trends to isolation them by national society, unemployment, aggravating health situation, still low level of education among Romany childern and youth. Roma Education after year 1989 was still in bad condition. Almost half of 8-12 milions of Roma people in Europe were in school age. 30 - 40% of children don't get elementary education. Roma pupils have still problems with reading and writing. Usually they don't continue education in high school. Almost 54% of adult Roma people in Europe are illiterates, in some regions even 80-100%.

### SHORT REPORT FROM RESEARCH

Project goal is: Indication of differences in the presented attitude towards education and cultural differences and the sense of identity of the Roma. Central area of interest is Roma identity, its transformation, attitude to education. Conclusions from the research conducted in Poland were the basis for the formulation of the research problem: What is the feeling of Roma identity and their attitude towards education? Can the relationship between cultural identity and Roma identity and their relation to education and school fulfillment be recognized? Identity is central to research interest. The purpose of the research: to indicate the differences in the attitude towards education and cultural differences and the sense of identity of the Roma. Adoption of relative dynamics: diagnosis for 2 groups: 1) students in segregation and integration education; 2) youth and adults.

Main problem is: Can the relationship between cultural identity and Roma identity and their relation to education and participation be seen? 3 diagnostic problems corresponding to theoretical threads: Problems related to Roma culture; Roma Identity Problems; Problems related to Roma education. Specific problems (Culture): 1. Are the Roma aware of their cultural differences as they understand it? 2. Do the Roma engage in social and cultural life of their own or majority groups and how do they assess their activity? 3. What experiences are there in Roma culture? 4. What attitude to their own and what other people declare / show Roma and to what extent? 5. Do they favor their own cultural group? 6. In which direction is the acculturation of the Roma, the culture of its own or dominant? 7. What cultural patterns are conveyed in a homogeneous and heterogeneous family? Specific problems (Identity): 1. What are the identity behaviors of the Roma? 2. How do the Roma perceive themselves and their behavior? 3. What - in the opinion of the respondents - are the criteria for being a Roma? 4. What identity profiles do they accept (one, two, multi-dimensional)? 5. What is the dynamics of identity formation in individual Roma groups? 6. What is the dynamics of identity formation in Roma and mixed families? 7. And what elements of identities are common, different for representatives of Roma groups and for the country of residence? Specific problems (Education): 1. Do the Roma engage in group education or do they work in majority-group education and how do they assess their activity? 2. What are the experiences related to functioning in education declared by the Roma? 3. To what extent does the country of residence of the Roma condition their participation in education? 4. How does Roma schooling fulfillment in the studied countries take place? 5. How do Roma perceive education and school duty (help, assistants, programs)? 6. What is the participation of Roma children in education (network of schools, number of students, school achievements)? 7. And to what extent do Roma get knowledge about their own culture at school? Specific problems (Identity and participation in culture and education): 1. How do identity profiles fit into the majority culture? 2. How do identity profiles assume participation in education? 3. And to what extent does the identity change from tribal to national? 4. And to what extent does the identity change to one-dimensional to multidimensional?

There is also a description of Roma participation in the culture of majority societies, the implementation of school attendance and participation in education. It seems important to emphasize the educational thread, the institution, the school network, the number of pupils, their participation in education, attendance, school achievement. The project is an attempt to show the difference between Roma education and the dominant community in their country of residence. The purpose of the project was to identify the Roma's attitude towards education and the school duty.

The study was conducted: in Slovakia (I-VI 2015) in: Nitra – Orechov Dvor, Koszyce – Lunik, Poprad – Hranovnica, Letanovce, Hrabusice, Zehra, Hrusov, Bratislava, Dunajska Streda; in the Czech Republic (III-V 2016) in: Zlin, Prague, Straz pod Ralskom, Hradec Kralove, Usti nad Labem.

We have experienced problems in conducting research. They were related to: specificity of the group, difficulty entering the group, problems of cultural differences, language problems, communication skills, technical - exclude the use of quantitative approach, transition from individual to collective interview, researcher relationship – investigated, stereotypes, subjectivity, ethical implications, intercultural competence of the researcher and the researcher.

Studies were conducted in the towns and villages (also of the Roma settlements) in the Czech Republic and in Slovakia. The selection of participants reflected the group divisions and the size of this community in both countries. Most respondents, interviewees were male. This was due to cultural reasons. Often interviews went from individual to collective. Most of the respondents were characterized, although in the labor mobility declarations. Accepted identity profiles were from one dimensional to multidimensional. The latter was more often declared. They were denominated in groups, family, and world citizenship. There were no significant differences between heterogeneous and homogeneous families.

During the study, the multidimensionality of Roma identification was noted. Discovery of a certain outbreak of ethnicity. This could be related to the mobilization of group elites. Attempts to adapt and integrate with the majority may be due to the significant role of European Union aid programs. Otherwise, the Roma declare their group identification during censuses (they are reluctant to admit their identity) and otherwise they can participate in projects and be their beneficiaries.

Researchers have found that, despite being treated by Roma as a majority of the population as a cultural group, Roma themselves declare little awareness of cultural, social or social differences. Stereotypes perceive their own culture. They point to music, dance, singing, folklore. Acceptance for cultural differences, Gadzi's otherness is noticeable

During the study the positive thinking of the Roma about school segregation was revealed. They have a sense of security that children learn in school with other members of the group. They do not perceive the role of classes, schools of integration character. Among the Roma appeared low educational awareness, negative school experience (in the adult group). The respondents positively assessed school attendance and the value of education. They pointed out the lack of opportunities to deepen their knowledge of self-help in formal education.

### CONCLUSIONS

Socialist governments of these countries have made unsuccessful efforts to assimilation of Roma people. As a result during transformation Roma society was one of the weakest educated and the most neglected group in Czech Republic, Slovakia. Education policy in these countries isn't satisfactory enough because of: ideals of multicultural education, the civilization development and an economical status of Roma people. Low level of education among Roma, the lack of job qualifications, difficult living conditions generate new problems and intensify social marginalization. The education can help Roma people in their economical situation as well as in more active social life. One of the biggest problem for Roma, besides low educational consciousness and low level of education is the school segregation – classes and schools only for Romany or very common special schools.

Every of these two countries has worked out their own educational and government programs, which are different from each other in moment of initiation, character and the way of realization.

Necessary conditions to change unsatisfactory reality is: a cooperation, an exchange of experiences and facts about Roma's education; equal educational chances for Roma's students (nursery education, pre-primary classes); the improvement of social situation Roma's children and their families (scholarship system); the elimination of any discrimination, intolerance and racism acts at schools; the liquidation of school segregation, learning in integration classes constructed by age and intellectual level; developing such institution as Romany assistant and teacher supporter; multicultural education programs at schools; an activity of Romany elite into creation and realization educational policy in their society; an increase of educational consciousness among Roma's parents and children.

The project has exploratory significance for this part of knowledge. It can be very useful source: theoretician (dealing with multicultural education), practicians (Roma assistants, teachers supporting Romanis/Gypsy activists, institutions engaged in favour of Romanis/Gypsy Society) and authors of governmental programs, which are to change Romanis/Gypsies situation.

It is also important that representatives of the Romani community, Roma leaders, members of various organizations and associations engaged in the Roma educational process share their opinions about relevant changes.



Moreover, everybody can benefit from the expertise and help of various experts on the education of ethnic and national minorities. Educated Romani elite should be engaged in the creation and management of the educational policies for their community. Roma students and university graduates should be supported throughout their university career. After the graduation, they should be subsequently engaged in different government programmes and projects implementation for their own community group.

Roma children need to be supported in kindergarten education, reception classes (0 - level) and encouraged to study in mainstream schools, situated close to their place of living. Roma educational organizations could support these practices (such NGOs already exist in the two researched countries).

It is necessary to raise educational awareness of Romani children and their parents. The whole process of engaging Romani families in their children education, adult education, pointing at positive role models, can be done with the help of public media but first of all, in cooperation of local organizations. Roma parents should be involved in their children's school life. School authorities and teachers can play here an important role in creating a friendly, unbiased environment for Roma children. Better educated and qualified teachers and educators, specializing in the work with Roma children should be supported and motivated by pay incentives and other forms of promotion.

The authors of this paper are aware that limited character of his work did not allow him to develop many issues in detail (difficulties related to the Roma children school motivation, school attainments analysis). Therefore, presented outcome might seem to be too general. However, because it is a complex problem, it can be further developed and analysed in detail. The publication is a description and an evaluation of the Romanis 'educational situation and constitute the comparison of the educational Romani reality with the Roma's and non-Roma's expectations towards the education policy implemented by the administrative authorities.

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# School Autonomy in the United States According to the Pisa Report:Analyses, Empirical Evidences and Proposals

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## ABSTRACT

There are many variables that affect the management of school autonomy in the United States, which is the decision-making capacity of schools to improve the outcomes of students and meet the needs of the sociocultural context. These variables differ from one state to another. The study aims to analyze the percentages, means, correlations among the quantitative variables and the independence of categorical variables that affect the management of pedagogical autonomy at schools in USA. The results of PISA school and general teacher questionnaires from the 2015 data collection were analyzed with the statistical analysis program SPSS. Findings suggest that the type of school (public/private) where teachers are working is not related to their responsibility for choosing which textbooks are used, determining the course content or deciding which courses are offered. Moreover, 51 percent of principals affirm that they provide staff with opportunities to participate weekly in school decision making and 41 percent hold that this occur once a month. Finally, a 4-stage plan has been designed for improving school management and pedagogical autonomy.

Keywords: PISA, school autonomy, school management, teacher autonomy.

## INTRODUCTION

In 2013, a study proved that school autonomy can lead to positive results of students in well-developed educational systems, but can be harmful in low-performance systems. To reach this conclusion, a panel data set was created from the 2000 to 2009 international PISA tests. This included over one million students in 42 countries and proved that local autonomy has an important impact on student performance. However, this impact systematically varied among the countries, in accordance with the level of economic and educational development. In simpler terms, countries with otherwise strong institutions gain a considerable amount from making decentralized decisions in their schools, while countries that lacked such a strong existing structure were harmed by the decentralization of decision making. In the United States, the autonomy of the schools to select content decreased from 2000 to 2009 (Hanushek, Link, & Woessmann, 2013). Another study showed that PISA holds a very influential position in the teaching of school policies throughout the world. Its conclusions and recommendations have considerable weight in debates on national policies. The secondary analysis of the PISA data showed that accountability policies resulting from using student performance data to evaluate teachers and assign resources were associated with poorer student performance (Murphy, 2014). A study measured the effects of teaching time on achievements. The study of a sample group of 15-year-old students from over 50 countries showed that additional teaching time had a positive and significant effect on the reuslts of the PISA test (Lavy, 2015). A study created a framework to re-conceptualize the study on school autonomy, correcting traditional study limitations and reinforcing ties between autonomy and the learning outcomes. The conclusions showed that internal autonomy of schools is not sufficiently differentiated, since autonomy is measured from the point of view of the directors and does not consider the perspectives of other important people, such as the teachers (Cheong, Ko, & Tai Hoi Lee, 2016). According to the results of the latest PISA report, the United States remained in the middle of the classification among the 35 OECD countries. Its performance was around the average in reading and sciences, but was below average in mathematics. One of every five 15-year-old students in the United States underperformed, not reaching PISA level 2 in scientific competence. At the other end of the performance scale, 9% of the students in the United States reached the highest level, achieving level 5 or 6, comparable to an average of 8 in the OECD (OECD, 2016).

In Boston, the implementation of administrative responsibility coincided with a change in the political leadership of the city's school district. The business and institutional leaders established a commitment to the public schools of the city in 1982 through the Boston Compact, an agreement with the Boston Private Industry Council.



Through this, the main private companies and universities in Boston agreed to offer work positions and scholarships to secondary school students in exchange for an improved academic performance. In Boston, the percentage of public school students who attend independent schools increased from 7.4 in 2006 to 10.5 in 2012, placing the city in the lower half of the big city classification. Since its start, independent schools in Boston have been perceived to be a threat to public education, and have thus brought about the formation of a corporate alignment of city officials, unions and a united local organization that proposes alternatives to improve the educational performance of the districts (DiGaetano, 2015). A study compared the working conditions at independent schools run by management organizations (MOs) with the conditions that teachers experience at autonomous schools. It considered the differences in the level of autonomy among the schools, professional development, the levels of administrative support, the support of the teachers and parents, the working hours of the teachers and the levels of compensation. The results showed that teachers at charter schools, managed by MOs, had lower levels of autonomy than teachers at other charter schools. They also received lower levels of compensation than other charter school teachers (Roch & Sai, 2015). The aim of a recent study was to compare the predictors and results of the teachers' job performance at charter schools with regular public schools in the Southern United States, where organizational and managerial autonomy is the main difference. Both the predictors and results of the teachers' job performance were examined in these two school environments, considering that ERP is the extra performance index of teachers who go beyond expectations. According to the results, teacher self-efficiency is the only common predictor of the teachers' ERP in both school systems, which has significant implications. Educational research, policies and professionals seek ways to promote school performance and improvement (Duyar, Pearson, & Ras, 2015). California's Charter School Act of 1992 gave parents the right to send their children to public charter schools, schools where teachers have more autonomy. Hope Charter School (HCS), located in a densely populated area of Los Angeles, was founded in 2002 by local community directors, teachers, parents and financers. A case study on this school showed that it had a work environment full of positivity and productivity. However, this environment was not sustainable over the longterm since the flexibility of the board of directors had conflicts with the ability of the teachers to make decisions (Montaño, 2015). Charter elementary schools welcome students who are at risk of having reading problems, so they emphasize a critical role in literacy. The first year of the literacy programs, K-3, in US primary schools has advantages and disadvantages. The results of the study suggest that the teacher's performance and the autonomy of the organization allowed for the development of the literacy programs in each school, while student mobility was an obstacle (Ross, Pinder, & Coles-White, 2015). An impact study compared the teachers' perceptions of autonomy and accountability at public charter schools (PCS) and at traditional public schools (TPS). The data was examined from the 2011-2012 course surveys that were part of the United States Department of Education (DOE) and the Schools and Staffing Survey (SASS). SASS is a national representation of the public school districts, which were selected in each state, and then several teachers were selected at random from each school. Based on the results, it was deduced that TPS teachers did not feel more responsible than PCS teachers (who reported less bureaucracy). However, TPS teachers felt that that they had less control over their job. Secondly, the teachers said that they had relatively high levels of autonomy and low levels of accountability. There was little evidence that the job security of the teachers depended on the results of the students in the external assessments (Oberfield, 2016). A blended learning initiative was carried out at a large secondary school in the Midwest of the United States. The perspective of the SRL included three specific phases in the students' learning processes: Forethought, Performance and Self-Reflection Phases. The opinions of the students, teachers, directors and parents were studied. The results of the study suggested that the combined learning initiatives promoted autonomy and self-regulation, encouraged research, built relationships and improved the students' confidence in achieving academic success at University (Whiteside, Garrett Dikkers, & Lewis, 2016). The deregulation movement has affected the social, political and economic landscape of the United States. Deregulation provides families and students with more options of where and how their K-12 education takes place. The designation used for primary and secondary schooling includes magnet schools, charter schools, open enrollment programs and vouchers. The deregulation of education has the potential to benefit some members of society, but harm others (Dorsey & Plucker, 2016). The effect of autonomous schools on enrollment in private schools is of utmost importance from several perspectives. Private schools are an integral part of the K-12 education system. A study examined the impact of autonomous schools on the enrolment in private schools, and there was a significant increase of autonomous schools in Michigan in the 90s.



The data that was used included biannual data from private school surveys conducted by the United States Department of Education and data from autonomous schools obtained by the Michigan Department of Education. No proof was found that the charter schools in Michigan caused a decrease in the number of enrollments in private schools (Chakrabarti & Roy, 2016). Over the last 25 years, the policies of charter schools have rapidly, but unequally, extended across the United States, with significant variations in each state. In Michigan and Oregon, the mobile education policies make up and remodel these policies (Cohen, 2017). Georgia is the only state that offers governance flexibility options for the entire education system. The aim of a recent study was to examine the impact of these options on the allocation of resources and the recruitment of personnel in the 173 school districts of the state of Georgia. The results focused on the system's income sources, expenses per financial category and the number of positions per location (i.e., district office or school). It was concluded that instead of accessing the additional income, the members of the local school board and the district leaders decreased the local investment in education as a potential way to increase political capital and their popularity (Kramer, Lane, & Tanner, 2017). Autonomous schools are a new phenomenon in American education. Since the first charter school was inaugurated in Minnesota in 1991, they have extended to 42 states and represent 6.2% of the public schools in the country. Based on this situation, a study was made with the hypothesis that the differences among charter schools were due to differences in the level autonomy of the school district. In Milwaukee (Wisconsin), there are three types of autonomous schools with different levels of autonomy. The conclusions suggested that more independent autonomous schools were more effective than autonomous schools with lower levels of autonomy (Flanders, 2017). The aim of another study was to explore the sense of autonomy in two large American public schools. Semi-structured interviews were performed with 11 teachers and two directors in two public schools in Louisiana. The results showed that a teacher's sense of professional autonomy was related to the socioeconomic background of the students. This means that teachers at poor schools have drastically less freedom in their local councils than educators at schools with more economic resources (Cleary, 2017). Public education in the United States is undergoing profound changes. Neoliberal policies believe that, according to economic law, all goods and services must be privatized and proportioned across competitive markets. Neoliberalism not only changes the structure of society, but also changes the relationship between the individual and society. This influences school autonomy since teachers make decisions within the limits of those provided by the market. The countries that have a more successful educational system and a better quality of life are those with the lowest rates of inequality and poverty. We must demand that schools and social services have more than enough funding (Hursh, 2017). There are several schools that generate better academic results in the student. For example, No Excuses charter schools steer their students toward high academic expectiations and pursue the goal of the student going to university. They also have codes of conduct, extended teaching time and directed education (tutoring for underperforming students, for example). The results highlight the relative success of No Excuses charter schools since the mathematical achievement of students who attend No Excuses autonomous schools is a standard deviation of 0.25 higher than the levels of students who attend traditional public schools. The reading achievement of students who attend No Excuses charter schools is a standard deviation of 0.15 higher than the achievements of students who attend traditional public schools (Cheng, Hitt, Kisida, & Mills, 2017). In 2014, there were charter schools in 42 of the United States, and almost 2 million children were enrolled at approximately 6,200 charter schools. Although this level of registration and the number of schools represent a relatively small percentage of total public school enrollment in the United States, in many urban school districts charter schools constitute the majority or a significant part of the schools available. The concentration of urban charter schools has had a considerable impact on the communities in which these are located (Scott, 2015). One study has compared the management of nonprofit charter schools in Florida, where the participation of the charter school community has grown by 80% since the 2004-5 school year to almost half of charter schools in 2012-13. The information provided by financial audits and the statements of account submitted by all the charter schools in Florida with publicly available records was analyzed. The results suggest that profit-seeking schools spend more than 10% less per student (Singleton, 2017). Almost all the states in the United States have promoted the creation of charter schools in order to improve the performance of students with special needs. These schools operate with greater autonomy and flexibility than traditional public schools do, but at the expense of democratic accountability mechanisms. Autonomous school managers use independent schools and innovative methods that offer greater opportunities for disadvantaged communities in terms of education to enter universities.


This freedom to innovate has a cost: in their current form, autonomous schools function without any accountability, although they are funded by the government in order to educate students without the traditional supervision of the school district (Nacleiro, 2017). A study has examined the surveys of the nonprofit school boards and the members of the elected public school board in Minnesota. The results suggest that the members of nonprofit school boards consider that there is a lower level of conflict and a greater level of responsibility in the area of financial management than members of the elected school board do. Nonprofit schools have important implications for accountability in public education (Ford & Ihrke, 2016).

# THE STUDY

The methodology of quantitative research assesses the range, statistical descriptions and generalization of data. A quantitative focus is centered on research to achieve impartiality, control and accurate measurement. These focuses are based on deductive designs with the aim to disprove or create proof in favor of specific theories or hypotheses (Leavy, 2017). Quantitative research makes it possible to generalize a larger, more universal population. Generally, it analyzes the data through the use of statistics, or a mathematical representation of the data that can be used for the significance comparison and to make predictions. Statistics strive to create an objective comparison of the data. Correlation studies use statistical analyses to determine the relationship between two or more variables (Allen, 2017). Quantitative research is a methodological process. It has quantitative focuses that can understand the underlying relationships of the data. Based on the results of the quantitative research, the statistical significance is deduced using the P-value (Albers, 2017). One of the most used correlation indexes is the Pearson correlation for parametric tests, which provides the researcher with a Pvalue (e.g., significance level). The P-value determines the direction of the correlation (direct/positive, inverse/negative or non-existent) (Weaver, Morales, Dunn, Godde, & Weaver, 2017). Person's r is the coefficient chosen when the relationship between X and Y is linear and both variables are measured on an interval or ordinal scale. The correlation coefficient is an index that expresses the magnitude and direction of association between two variables. In bivariate cases (i.e., only one X and one Y), r represents the amount of concomitant variation between X and Y (Price, 2017).

The Pearson value can vary between -1 and +1. Both the absolute value and sign are important. A clear, nonlinear relationship will have a low r value. An example of a perfect positive relationship is when the numbers of the first variable go up to 1. The Pearson value also indicates the strength of the relationship (weak, moderate or strong). A Pearson's r value of +/-0.10 is considered to be weak correction, +/- 0.30 represents a moderate correlation and +/- 0.50 or greater shows a strong correlation (Wilson & Joye, 2017). If the relationship were perfect, the Person's r value would be 1.00. A value of 0.00 indicates the complete absense of a correlation (Patten, 2017).Covariance is the shared variance between X and Y. The formula for covariance is essentially the mean value of the products of the paired deviation scores. If variables X and Y are positively correlated, then the deviation scores tend to have the same sign, their products tend to be positive and the covariance will have a positive value (greater than 0). If the X and Y variables are negatively correlated, then the deviation scores tend to have opposite signs, their products tend to be negative and the covariance will have a negative value (less than 0). If the X and Y variables are not related, then the deviation scores will have equal and opposite signs, their procducts will be positive and negative (summing to zero) and the covariance value will be 0 (Hahs-Vaughn, 2017).

The chi-squared test has been used to identify the relationship between two categorical variables with any number of degrees (Fagerland, Lydersen, & Laake, 2017; Privitera, 2017). SPSS is a general program for the handling and analysis of data that makes it possible to create a sophisticaed analysis from data sources. The logical progression of the analysis can be easily visualized through file recovery. For some procedures, it is more efficient than using survey menus. The syntax can be stored and then opened to re-do or modify the analysis (Galderisi, 2015). The SPSS statistical analysis program gives you the option of making a one or two-tailed analysis as a significance test. If we want to predict a correlation, without specifically knowing if it is positive (the values of both variables increase and decrease together) or negative (the values of one variable increase while the values of the other variable decrease), the two-tailed test is used (Hinton & McMurray, 2017).

The objective of this study is to analyze the percentages, means and correlations among the variables that affect the management of pedagogical autonomy at schools in USA. The results of PISA school and general teacher questionnaires from the 2015 data collection were analyzed.

The data have been analyzed with the statistical analysis program SPSS, which gives an ample variety of analytical functions, descriptive statistics, linear regression and functions to create reports and quality presentation graphics, as well as multiple data formats without size restrictions.

## FINDINGS

This study put special emphasis on the analysis of questions about school management.

School Questionnaire (distributed to the principal or designate). One hundred seventy one principals completed the questionnaire.

Please indicate the frequency of the following activity in your school during 2014-2015 academic year.

Item 1 "I provide staff with opportunities to participate in school decision-making". According to the data shown in the graph 1, 1.2 percent of respondents affirm that this does not occur, another 1.2 percent say that it occurs 1-2 during the year, 5.8 percent affirm that it occurs 3-4 times during the year, 40.9 percent hold that this occurs once a month, 26.9 percent maintain that this happens once a week and 24 percent affirm that it occurs more than once a week. The mean is 4.63, therefore the mean of answers is "once a month /once a week".



Frequency of <the last academic year>. I provide staff with opportunities to participate in school decisionmaking

Frequency of <the last academic year>. I provide staff with opportunities to participate in school decision-making

Graph 1. Item 1 "I provide staff with opportunities to participate in school decision-making". Frequency of this activity in the school during 2014-2015 academic year.

Item 2 "I engage teachers to help build a school culture of continuous improvement". According to the data shown in the graph 2, 0.58 percent of respondents affirm that this did not occur, another 0.58 percent say that it occurs 1- 2 times during the year, 5.26 percent affirm that it occurs 3-4 times during the year, 26.32 percent hold that this occurs once a month, 29.24 percent maintain that this happens once a week and 38.01percent affirm that it occurs more than once a week. The mean is 4.97, therefore the mean of answers is "once a week".



Frequency of <the last academic year>. I engage teachers to help build a school culture of continuous improvement.

Graph 2. Item 2 "I engage teachers to help build a school culture of continuous improvement". Frequency of this activity in the school during 2014-2015 academic year.

Item 3 "Does external school evaluation (evaluation as part of a process controlled and headed by an external body) exist in your school and where do they come from?" According to the data shown in the graph 3, 68.9 percent of respondents affirm that this is mandatory, e.g based on district or ministry policies, 15 percent hold that this is based on school initiatives and 16,2 percent deny it. The mean is 1.47, therefore the mean of answers is "this is mandatory / it's based on school initiative".



# Does improvement exist at school? External evaluation

Does improvement exist at school? External evaluation

Graph 3. Item 3 "Does external school evaluation (evaluation as part of a process controlled and headed by an external body) exist in your school and where do they come from?"

General Teacher Questionnaire. Two thousand and seventy-five teachers answered the question 4 "To what extent do you disagree or agree with the following statement regarding your school? The principal ensures our involvement in decision making". According to the data shown in the graph 4, 6.9 percent of respondents strongly disagree with the item, 19.3 percent disagree, 46.4 percent agree and 27.4 percent of respondent strongly agree with the item. The mean is 2.94, so the mean of answers is agree with the item 4.



The principal ensures our involvement in decision making.

Graph 4. Item 4 "To what extent do you disagree or agree with the following statement regarding your school? The principal ensures our involvement in decision making".

Two thousand and eighty-one teachers answered the item 5 "On average, how often do you work with other teachers in your school to ensure common standards in evaluations for assessing student progress?" According to the data shown in the graph 5, 7.35 percent of respondents never work with other teachers, 8.17 percent do this one a year or less, 16.24 percent do this 2-4 times a year, 14.56 percent of teachers work 5-10 times a year with other teachers, 25.66 percent do it 1-3 times a month and 29.02 percent, once a week or more. The mean is 4.27, so the mean of answers is "5-10 times a year".





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Graph 5. Item 5 "On average, how often do you work with other teachers in your school to ensure common standards in evaluations for assessing student progress?"

Three thousand one hundred and seventy teachers answered the item 6 "Is your school's capacity to provide instruction hindered by the following issue? Inadequate or poor quality educational material (e.g., textbooks, IT equipment, library or laboratory material)". According to the data shown in the graph 6, 35.90 percent of respondents say that "Not at all", 30.60 percent affirm that "Very little", 24.64 percent hold that "To some extent" and 8.86 percent maintain that "A lot". The mean is 2.06, so the mean of answers is "Very little".



Inadequate or poor quality educational material (e.g. textbooks, IT equipment, library or laboratory material).

Inadequate or poor quality educational material (e.g. textbooks, IT equipment, library or laboratory material).

Graph 6. Item 6 "Is your school's capacity to provide instruction hindered by the following issue? Inadequate or poor quality educational material (e.g., textbooks, IT equipment, library or laboratory material)".

# School questionnaire:

Case 1. The independence of two categorical variables: Type of school and the considerable responsibility/not responsibility of teachers for choosing which textbooks are used. The null hypothesis is that the type of school (public/private) where teachers are working is not related to their considerable responsibility for choosing which textbooks are used. Both variables are independents. The alternative hypothesis is that the type of school (public/private) where teachers are working is related to their considerable responsibility for choosing which textbooks are used. According to data in Table 1, one hundred seventy three teachers answered the question. If the asymptotic significance (bilateral) is greater than 0.05, the null hypothesis is accepted. The asymptotic significance is 0.071. It is therefore concluded that the type of school (public/private) where teachers are working is not related to their consol (public/private) where teachers are working is not related to the school where teachers are working is not related to the school school (public/private) the asymptotic significance (bilateral) is greater than 0.05, the null hypothesis is accepted. The asymptotic significance is 0.071. It is therefore concluded that the type of school (public/private) where teachers are working is not related to their responsibility for choosing which textbooks are used.

	Valid		Missing Values		Total	
	N	Percentage	Ν	Percentage	Ν	Percentage
Choosing which textbooks are used: Teachers * Is your school a public or a private school2	<ul> <li>173</li> <li>162=public</li> <li>school</li> <li>teacher</li> <li>11=private</li> <li>school</li> <li>teacher</li> </ul>	97.7%	4	2.3%	177	100%
Pearson's Chi-square	Value 3.270 <sup>a</sup>	df 1	Asymptotic significance (bilateral) .071		L	L

Table 1. The independence of two categorical variables: Type of school and the considerable responsibility/not responsibility of teachers for choosing which textbooks are used.

Case 2. The independence of two categorical variables: Type of school and the considerable responsibility/not responsibility of teachers for determining the course content. The null hypothesis is that the type of school (public/private) where teachers are working is not related to their considerable responsibility for determining course content. The alternative hypothesis is that the type of school (public/private) where teachers are working is related to their considerable responsibility for determining the course content. According to data in Table 2, the asymptotic significance is 0.056, so the null hypothesis is accepted. It is therefore concluded that the type of school (public/private) where teachers are working is not related to their considerable responsibility for determining the course content.

	Value	df	Asymptotic significance (bilateral
Pearson's Chi-square	3.655ª	1	.056

Table 2. The independence of two categorical variables: Type of school and the considerable responsibility/not responsibility of teachers for determining the course content.

Case 3. The independence of two categorical variables: Type of school and the considerable responsibility/not responsibility of teachers for deciding which courses are offered. The null hypothesis is that the type of school (public/private) where teachers are working is not related to their considerable responsibility for deciding which courses are offered. The alternative hypothesis is that the type of school (public/private) where teachers are working is related to their considerable responsibility for deciding to data in Table 3, the asymptotic significance is greater than 0.05 (0.120), so the null hypothesis is not related to their considerable responsibility for deciding which courses are working is not related to their considerable responsibility for deciding where teachers are working is not related to their considerable responsibility for deciding where teachers are working is not related to their considerable responsibility for deciding where teachers are working is not related to their considerable responsibility for deciding where teachers are working is not related to their considerable responsibility for deciding where teachers are working is not related to their considerable responsibility for deciding which courses are offered.



	Value	df	Asymptotic significance (bilateral
Pearson's Chi-square	2,421ª	1	.120

Table 3. The dependence of two categorical variables: Type of school and the considerable responsibility/not responsibility of teachers for deciding which courses are offered.

General teacher questionnaire:

Case 4. The correlation between two quantitative variables: Year(s) working as a teacher at this school and how often do teachers work with other teachers in your school to ensure common standards in evaluations for assessing student progress. According to data in Table 4, Pearson's correlation coefficient is -0.60, which indicates that there is a strong negative correlation between the two variables. High scores on X are associated with low scores on Y. It is concluded that the more years working at the same school, the less frequency with which teachers work with other teachers to ensure common standards in evaluations for assessing student progress.

		Year(s) working as a teacher at the same school	Work with other teachers in my school to ensure common standards in evaluations for assessing student progress
	Pearson's	1	-0.60
	correlation coefficient		
Year(s) working as a	Covariance	58.306	-7.34
teacher at the same	Ν	2008	•
school			

Table 4. The correlation between "Year(s) working as a teacher at the same school and how often do teachers work with other teachers in your school to ensure common standards in evaluations for assessing student progress"

The covariance is -7,34, which means that the X and Y variables are negatively correlated, the deviation scores tend to have opposite signs and their products tend to be negative.

Case 5. The correlation between two quantitative variables: Year(s) working as a teacher at this school and how often do teachers exchange teaching materials with colleagues. According to data in Table 5, Pearson's correlation coefficient is -0.008, which indicates that there is a weak negative correlation between the two variables. High scores on X are associated with low scores on Y. It is concluded that the more years working at the same school, the less frequency with which teachers exchange teaching materials with colleagues. The covariance is -1.020, which means that the X and Y variables are negatively correlated, the deviation scores tend to have opposite signs and their products tend to be negative.



		Year(s)	wor	king	as	a	Exchange	teaching
		teacher	at	the	sar	ne	materials	with
		school					colleagues	
	Pearson's	1					-0.088	
	correlation coefficient							
Year(s) working as a	Covariance	58,306					-1.020	
teacher at the same	Ν			4	2005			
school								

Table 5. The correlation between "Year(s) working as a teacher at the same school and how often do teachers exchange teaching materials with colleagues"

Case 6. The correlation between two quantitative variables: Year(s) working as a teacher at this school and how often do teachers observe other teachers' classes and provide feedback. According to data in Table 6, Pearson's correlation coefficient is -0.41, which indicates that there is a moderate negative correlation between the two variables. High scores on X are associated with low scores on Y. It is concluded that the more years working at the same school, the less frequency with which teachers observe other teachers' classes and provide feedback. The covariance is -.428, which means that the X and Y variables are negatively correlated, the deviation scores tend to have opposite signs and their products tend to be negative.

		Year(s)	woi	king	as a	Observe	other	teachers'
		teacher	at	the	same	classes	and	provide
		school				feedback	2	
	Pearson's	1				-0.41		
	correlation coefficient							
Year(s) working as a	Covariance					-,428		
teacher at the same	Ν				200	)6		
school								

Table 6. The correlation between "Year(s) working as a teacher at the same school and how often do teachers observe other teachers' classes and provide feedback".

The discussion allows the comparison between the findings of this study and the previous empirical evidences from investigations carried out in the United States, from 2014 until the present.

Case 2. The type of school (public/private) where teachers are working is related to their considerable responsibility for determining the course content. This finding reinforces the results of a study published in 2014, which suggested that principals of primary schools in Chicago were more probable to exercise autonomy over the school budget and the curricular methods than over professional development and the schedule (Steinberg, 2014).

Case 3: The type of school (public/private) where teachers are working is not related to their considerable responsibility for deciding which courses are offered. This finding supports a study from 2016, which brought up questions about the way in which autonomous schooling, propelled by the imperatives of the market, is undermining the integrity of public education, associated with the values of equity and access. There is the worry that autonomy, intended as a market between schools, undermines inclusive, collaborative, and locally receptive governance. In relation to equity and access, there is the worry that this situation promotes segregation and stratification between schools, which lead to exclusionary practices (Keddie, 2016).

Case 4: The more years working at the same school, the less frequency with which teachers work with other teachers to ensure common standards in evaluations for assessing student progress.



This finding reinforces the results of a study carried out in the United States in 2016, whose objective was to compare perceptions of teachers at public, autonomous schools with perceptions of others at traditional schools, showed that the latter (teachers at traditional schools) did not feel more responsible for the results obtained by the student body than the teachers at autonomous schools. However, teachers at autonomous schools, with less bureaucratic control of their work, feel more isolated in their teaching profession (Oberfield, 2016).

# CONCLUSIONS

According to the graph 1, 51 percent of principals affirm that they provide staff with opportunities to participate weekly in school decision making and 41 percent hold that this occur once a month. Only 6 percent of principals provide staff with opportunities to participate 3-4 times during the wear in school decision making. According to the graph 2, 67 percent of principals engage teachers to help build a school culture of continuous improvement at least once a week and 26 percent maintain that this occur once a month. Only 5 percent affirm that this occur 3-4 times during the year. According to the graph 4, 74 percent of teachers agree with the item "The principal ensures our involvement in decision making" and 26 percent of teachers disagree with the item. The teachers' opinion on the participation in school decision agrees with the principals' opinion. This conclusion agrees with findings of other studies in the field. The school districts in the United States have less autonomy when making teaching-curriculum- and school management-based decisions at a local level due to harsh accountability measures. For this reason, educational programs are emerging that are based on collaboration and instruments that measure the effectiveness of the collective administration of the schools (Díaz-Gibson, Civís-Zaragoza, & Guàrdia-Olmos, 2014; Reyes-Guerra, Russo, Bogotch, & Vásquez-Molina, 2014).

According to the graph 6, 36 percent of teachers hold that the school's capacity to provide instruction isn't hindered by inadequate or poor quality educational material and a third of teachers say that "very little" and 24 percent of teacher affirm that "to some extent". According to data in graph 3, nearly 7 in 10 American principals maintain that the external school evaluation is mandatory, 15 percent of principals affirm that the school evaluation is based on school initiatives and 16 percent hold that external evaluation don't exist in their school. This conclusion coincides with the findings of other authors. The aim of the study carried out in California was to understand the role of human resource professionals in teacher management at primary and secondary schools. School employers believe that the role of human resource professionals follows a philosophy based on the strategic training of human resource management (Tran, 2015).

According to the graph 5, 7 percent of teachers never work with other teachers, 8 percent do this one a year or less, 16 percent do this 2-4 times a year, 14 percent of teachers work 5-10 times a year with other teachers, nearly 26 percent do it 1-3 times a month and 29 percent of teachers, once a week or more. This conclusion agrees with the findings of other studies. Contrary to innovative approaches, the lesson study is an approach that improves teaching quality in the United States. Fifty-five teachers at two primary schools in Los Angeles participated in a study. The aim of the study was to understand the teachers' attitudes toward this focus. The results showed significant associations between the teachers' comfort levels and their collaboration, lesson observation, lesson critique and support of the study on lessons (Gero, 2105).

From the analysis of the independence between two categorical variables, it is concluded that the type of school (public/private) where teachers are working is not related to their responsibility for choosing which textbooks are used, determining the course content or deciding which courses are offered.

From the analysis of the correlation between two quantitative variables, it is concluded that the more years working at the same school, the less frequency with which teachers work with other teachers to ensure common standards in evaluations for assessing student progress, exchange teaching materials with colleagues and observe other teachers' classes and provide feedback. Missouri districts have the local decision-making power and flexibility to develop incentive programs aimed at teachers. The aim of several programs in the United States is for teachers to teach at difficult schools and improve their knowledge and skills. A study proved that, during the 2009-2010 academic year, 32 percent of the districts offered at least a financial incentive to hire teachers. The larger districts with higher salaries were more likely than the smaller districts to offer a greater number of salary incentive programs (Liang & Akiba, 2015).

Improvement Plan for Pedagogical Autonomy in Public Schools in the United States The proposals to get greater autonomy in the pedagogic field are included in a 4-stage plan.



Stage one. Diagnosis of the initial situation. Autonomy is not the same in all places, it depends on the starting point and objectives wished to be achieved (Fullan, 2014). In this stage, the strong points and needs of each school are made aware of to make educational provisions and methodological decisions. To obtain this information, individual in-depth interviews were carried out with the primary school teachers of each school. The categories were taken from the latest PISA report.

Categories	Definition
Attitudes and reasons	To know the attitudes of the teachers and the reasons for which they adapt the curriculum to the needs of the student and sociocultural and economic environment.
Sociocultural and economic environment	To explore the sociocultural and economic level of the families. To know the number of books that each student has at home, their parents' professions and their household income bracket.
Student body needs	To identify the learning style of each student, their study habits, learning difficulties and academic needs.
Curriculum	To analyze the measure of autonomy and decisions made by the teachers on the following aspects: content, methodology, resources, curriculum materials, syllabus, teaching activity schedule and education plan.
Support and cooperation	To know the cooperative relations and support of the schools to encourage their autonomy.
Difficulties and needs	To analyze the teachers' difficulties in adapting the curriculum, what they need and which suggestions are necessary.
Innovation	To strengthen the innovation programs carried out at the schools and the educational activities aimed at primary school teachers.

Table 7. Categories and definition of Improvement Plan for Pedagogical Autonomy in Public Schools in the United States.

Stage two. Similarities among schools. After analyzing the results of the interviews performed at each school, similarities among the schools of each district are investigated and a proposal is made to resolve the differences. Support networks among the schools and shared learning networks with the city council and local agencies are created. Based on the needs assessment, the networks provide a set of collaboratively undertaken objectives and the educational project of the school is rewritten, adding the objectives, values and manner in which to address diversity. The curricular project is also rewritten, including content sequencing, assessment guidelines and methodology criteria.

Stage three. Project contracted with the administration. A project contracted with the educational administration is designed, reflecting the objectives, actions to be carried out, timing, and educational, human and material resources necessary to offer quality education.

Stage four. Follow-up and evaluation. The educational administration performs a biannual follow-up on the meeting of the objectives, while the schools must demonstrate, each year, that the public resources have been efficiently used and have led to a real improvement in the results.



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The Vicerrectorate of Research and Scientific Policy of the University of Huelva has participated in this article.



# Setting Up New Learning and Teaching Environments – Nature Lab Altenberg, Austria

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# ABSTRACT

In 2012, the elementary school in Altenberg an der Rax, Austria was closed due to structural and demographic changes. Detected as an opportunity for future communal developments, this school was transformed into the nature lab Altenberg. Today it aims to be an innovative, practice-oriented competence-, teaching and research center. It sets an innovative framework for applied teaching and environmental education. The focuses are natural hazards in the eastern Alps and bordering regions, as well as human-environment interactions. Thereby, education is not only limited to university students but also accessible to pupils, interested laymen, the local population and other visitors. The nature lab and its surroundings can be denoted as a passable showcase for various processes and phenomena. As the sensitization for certain topics takes place in the realm of experience, absorbed information is processed on the factual and emotional level. The level of consciousness is enhanced through this process, which consequently influences future actions. This paper aims at drawing the conceptual framework for setting up such new learning and teaching environments with the example of the nature lab Altenberg.

# **INTRODUCTION**

Educational facilities hold an extraordinary position in our society that exceeds the primary purpose of education. Especially in rural areas, schools represent a major part of social infrastructure and a space for social interaction. Moreover, teachers and teaching assistants are authority persons and role models who significantly shape social norms, values and behaviors. They hold a pivotal role in the transfer of the regional culture and understanding of the local environment (Henkel, 2004). Barley and Beesley (2007) state 'the school is the community' that results in a feeling of pride and a place for multifunctional usage by numerous groups.

The linkage between local public schools, communities and the emergent sustaining momentum for positive regional developments has already been promoted by numerous authors (Harmon & Schafft, 2009). But what happens when elementary schools in rural areas close due to structural and demographic changes and these pivotal places of social interaction and identity building are missing? Phenomena like selective exodus and the shut-down of social infrastructure result in a reinforcing negative feedback loop fostering the process of social erosion (Simić & Harfst, 2017). Social erosion denotes the process of transition of a space due to the runoff of certain elements and following shrinking-processes that accelerate one another (Giffinger & Kramar, 2008). This means that the shutdown of public infrastructure – e.g. public schools – can lead to and even boost further negative developments.

Due to compulsory education, pupils enter elementary schools by age six in Austria - primary education, four grades, ISCED 1. Alternatively, students visit special needs schools or other schools with organizational statute (e.g. Waldorf schools). The Austrian statistical office STATISTICS AUSTRIA (2017) documents a decline of 16.3 % within the number of elementary school pupils in the period 2000 (393 600) to 2015 (329 600) in Austria, showing a gradually positive tendency since 2014. In the province of Styria, the decline of pupils in general is extraordinary high compared to the Austrian average. In combination with administrative reforms (e.g. Styria municipal structural reform 2015) the educational patterns in Styria have also been changed.



One of these changes was represented in the closing and restructuring of public schools. In the period school year 2000/2001 (559 primary schools) to school year 2015/2016 (461 primary schools) 98 elementary schools were closed in Styria (17.5 %). In total 188 schools were closed in Styria, which means that more than 50% of the closed schools were elementary schools.

# THE SITUATION IN ALTENBERG AND THE DAWN OF THE NATURE LAB IN 2012

The elementary school in Altenberg an der Rax was shut down in 2012. Being aware of this serious development and knowing the specific role of elementary schools in such rural settings, the school was transformed into the nature lab Altenberg in the same year along with numerous project partners. Using the tangible and intangible remains of the former elementary school, this space was reinterpreted (Ziehl et al., 2012), still drawing on the former utilization as an educational facility, but adapting it to current changes. The nature lab aims to be an innovative, practice-oriented competence-, teaching and research center. Due to its topographic, geological, natural- and cultural conditions, the nature lab and its surroundings can be denoted as a passable showcase for different processes and phenomena. The main organizational pillars of the nature lab are teaching and research, economy and tourism, communal and regional development and a platform for knowledge and experience exchange.

With the help of the nature lab, the outside image and self-perception of the area should change from a shrinking, unattractive region into a learning region. Florida (1995) defines learning regions as reservoirs accumulating knowledge, ideas and innovation and providing the needed infrastructure for the knowledge transfer and knowledge generation. The nature lab thematically focuses on human-environment interactions, natural hazards and risk management utilizing endogenous human infrastructure i.e. the regional knowledge and understanding of the space and joins it with external knowledge and practices of universities etc. The nature lab itself is part of this learning region and serves as the headquarter but does not represent the learning region or space itself. It is important to embed and link such projects to a region and not only to one location or building (Simić & Harfst, 2017).

The overall positive impact on the region was already discussed in previous articles – i.e. positive impact on communal development, increasing number of incoming visitors, tourists and overnight stays, gradual image change and rising self confidence among the locals and a platform for numerous topics (Simić & Harfst, 2017). This paper aims at drawing the conceptual framework for setting up such new learning and teaching environments.

# A CONCEPTUAL FRAMEWORK FOR NEW LEARNING AND TEACHING ENVIRONMENTS

The main paradigm of the organizational pillar teaching and research is based on the model of social action by Werlen (1993): The model rests upon the crucial understanding of 'action' as a 'reflexive and intentional activity'. All of our 'intentionally effecting or preventing a change in the world' is goal oriented and motivated by a specific intention. In turn, the intention is influenced by the socialization system and its norms, values and legislation but also by the subjective characteristics of the agent (person who sets an action). The action itself is a process of four sequences and intermediate reflection. It starts with the project of the action, a preparatory and anticipatory process in which the intention is created. This is followed by the definition of the situation which represents an interpretation of the intended goal; 'situation (i) is structured as situation (i')'. In the next step, the action is implemented which – in the final step - causes consequences for the environment, other actors and the actor. Actions produce and reproduce space.

In general, action is not possible without background information i.e. knowledge. Knowledge can be a premise for intentional actions but also the output of an action (Funke, 2017). Moreover, knowledge should be defined as a process undergoing changes and not a final state. It is a practice of codified, at most accessible information (Reitz, 2017). Looking at the model depicted in [Figure 1] there are two linking points – i.e. the socialization system and personal reflection and learning - to change the way how we produce and reproduce space by



**Figure 1** Conceptual Framework – nature lab Altenberg, own illustration based on Werlen (1993) utilizing environmental education.

Following the definition of the Austrian Federal Ministry of Education (2017), environmental education raises awareness of the natural, cultural, technical, built up and social environment. It focuses on human-environment interactions, enhances the willingness and provides competences for shaping the environment. Environmental education fosters a sustainable future development in the interplay of individual, communal, ecological and economic conflicts of interest. This interpretation of environmental education shows progress decoupled from the classical approach of awareness-raising by additionally providing and teaching competences and motivating the willingness among the population for active participation.

The former elementary school was primarily addressing pupils. In the nature lab, education and knowledge are not only limited to pupils but mainly accessible to university students, the local population, interested layman and other visitors (Fischer & Simić, 2016). Thereby the function of a learning region – addressing different population strata and providing needed tangible and human infrastructure and resources – is embodied.

'Labs' in general refer to urban environments and metropolitan areas. They go hand in hand with project-based work and a proximity to research and innovation institutions (Schmidt et al., 2016). The main dimensions are openness, flexibility and collaboration (Schmidt & Brinks, 2017). The nature lab and its learning region follows the administrative boundaries of the municipality Neuberg an der Mürz and the nature park Mürzer Oberland. The municipality is located in the picturesque landscape of the Eastern Limestone Alps and can be described as a rural area. However, it is almost half way between the agglomerations of the cities Vienna and Graz and is well connected by infrastructure but also mentally and emotionally as this area has ever since been used as a summer retreat. The partner universities have a long-lasting research interest in this area and there are innovative regional actors. This shows that labs can also be found outside of agglomeration areas if there is a sufficient tangible and human infrastructure and a strong commitment among the decision makers, actors and other participating parties.





#### INSTRUMENTS OF KNOWLEDGE CREATION AND KNOWLEDGE TRANSFER

# Figure 2 Environmental Education in the Nature Lab Altenberg (Simić 2017)

The process of knowledge creation and knowledge transfer is based on the nature lab's Co-Learning-Network approach [Figure 2]. The nature lab does not make use of one-sided teaching systems but enables knowledge creation and transfer as a mutual process in which all participating parties learn and broaden their knowledge in a specific field (Simić & Harfst, 2017). Moreover, the result is a comprehensive understanding of the region and new competences for setting actions following the basic idea of environmental education.

The partner network is a non-hierarchical pattern with individual organizational relations (Simić & Harfst, 2017). The universities – e.g. University of Graz, University of Natural Resources and Life Sciences, Vienna – hold the role of the scientific partners within the network. The universities provide knowledge and experience, set main frameworks, use outcomes and gather regional knowledge for further research. They include the local population as local experts, who on the one hand share their regional knowledge, every-day practice and spatial understanding. On the other hand, the local population gains external knowledge, higher awareness for related topics and competences for setting actions. The participating population supports the nature lab by reintegrating it into everyday life. The universities assist the municipality in transformation processes and give guidance and advice. In turn, the municipality includes the nature lab and its scientific findings in developmental plans and assists with organizing events. The nature lab is the medium between the partners that offers space and infrastructure for applied teaching, fieldwork and excursions, participation processes and a place for social interaction (Simić & Harfst, 2017; Fischer, 2014). With this approach, all partners face each other at eye level and instead of creating frustration and a lack of understanding that often occur because of hierarchic organizational models, all partners learn from and with one other.

As mentioned above, the local understanding and experience is joined with external knowledge and thereby new knowledge is created and made accessible for all participating parties. The result is a comprehensive understanding of the region and new competences (Simić & Harfst, 2017). Local knowledge and practice is often neglected. But without the local knowledge and everyday practice, external input cannot be translated to the settings on site.

The created knowledge is transferred following the reflexive sequences of the model of social action. In a first step, knowledge is acquired using thematic input-presentations and the shared experience of the participants. In the next step, the gathered information is structured and analyzed during discussions in smaller groups and various exercises. The final sequence of one circle is shaped by stakeholder and interest-conflict workshops, for example. Intermediate reflections follow each step and enrich the quality. Reflection is a 'vital element' in learning and a 'generic term'. It is a main component during various stages of the learning process (Boud et al., 1985), from the initial learning to the process of representation of learning and upgrading of learning from lower surface level to higher levels of consciousness and knowledge (Moon, 1999).

The various stages of the knowledge transfer take place in the realm of experience and therefore the absorbed input is processed on the factual and emotional level. This specific sensitization for certain topics enhances the level of consciousness, which consequently influences future actions (Ebers et al., 1998).

# DAILY ROUTINE IN THE NATURE LAB

The following section illustrates how this main framework and instruments of knowledge creation and transfer are embedded in the everyday practice of the nature lab [Figure 3].



# Figure 3 Nature lab in practice

1) Together with Gergely Horváth, a colleague from the Eötvös Loránd University in Budapest, Wolfgang Fischer (on the right) is guiding an excursion along the geomorphological educational trail which is prepared in an experience-based didactic way. At eight stations, the topics geological overview of the region, water, moraines, valley forms, karst hydrology, erosion and vegetation, ground moraines and anthropological morphology are illustrated and discussed right in the field together with the participants (students from Hungary and Austria during a bilateral exchange). Thereby the stations are not installed in the landscape as usual, which provides more flexibility when talking about a certain topic (Simić & Harfst, 2017). (Photo Simić, July 2014)

2) The voluntary fire brigade – rural social infrastructure with importance that goes far beyond the regular work of a fire brigade – takes students up to the Schneealm, where they explore the context between alpine farming (Almwirtschaft), touristic utilization, nature protection areas and other human-environment interactions. During the trip participants use the time to absorb input of the fire worker and raise question about the everyday life in the region. (Photo Simić, June 2014)

3) Innovative actors hold a key importance in the regional and communal development (Simić, 2017). The former mayor of Altenberg an der Rax (former independent municipality and today's cadastral municipality of the new municipality Neuberg an der Mürz since the Styria municipal structural reform in 2015) – Jakob Holzer – is accompanying an excursion and sharing real life experience from the very first day of the nature lab and how it developed over the last years. (Photo Simić, June 2016)

4) Leni – one of the oldest native 'Altenbergers' – is opening her doors regularly to invite visitors to listen to her personal stories, which she has documented in diaries, pictures and sketches for decades. This insight helps others to understand certain elements of the area and to get a local interpretation of the space, spatial tensions, challenges and chances. (Photo Simić, June 2016)

5) A group of geography students exploring the surroundings together with Jan Kopp (University of West Bohemia, Pilsen, Czech Republic), Wolfgang Fischer and Danko Simić focusing on the topics hydrology and climatology. Moreover, the students made a comparative analysis of hydrological systems on site and Czech examples. (Photo Simić, June 2014)

6) During an international summer school on *geodesign*, 17 students from nine different European countries and 11 partner universities spent three days in the nature lab. On the left: Wolfgang Sulzer, University of Graz. On the right: Gwosdz Krzysztof, Jagiellonian University in Cracow. (Photo Simić, September 2016)

7) Nature lab insight: The former classroom and today's lecture hall of the nature lab is equipped with modern presentation infrastructure and work materials. From 2013 to 2015 the nature lab hosted 27 university classes, field works and excursions organized by twelve different departments of the University of Graz and the University of Natural Resources and Life Sciences Vienna, five public events and a training center for becks. In 2014, 1200 overnight stays were recorded (Simić & Harfst, 2017).

On the right: A feeling of nostalgia; two students are heating the tiled stove. (Photo Simić, May 2013)

# CONCLUSIONS

The paper on hand discusses the main conceptual framework of the nature lab Altenberg and how these innovative learning and teaching environments were set up. Based on the model of social action by Werlen, the nature lab utilizes environmental education as a key to provide knowledge, awareness and competences for future actions and developments. Thereby, education is not only limited to pupils but also accessible to mainly university students, interested layman, the local population, decision makers, actors and other visitors.

The nature lab makes use of the co-learning network that promotes equal network partners who face each other on the same level and learn from and with each other. Knowledge is created by joining the local experience, everyday practice and understanding of the surroundings with external knowledge. Thereby new knowledge and a comprehensive understanding of the region is developed.

Although labs are urban phenomena in general, this example proves that even rural areas can successfully transform into learning regions by utilizing endogenous potential and linking it with external knowledge and innovation, keeping in mind the main dimensions of openness, flexibility, collaboration and accessibility. The nature lab Altenberg sets positive regional impulses, functions as a platform for specialist presentations, seminars, conferences and excursions, it connects universities, institutions, experts, students, the local population and interested laymen and it offers modern IT-infrastructure, seminar and lecture halls.

The nature lab is continuously reinterpreting and redefining itself. At the moment, a conceptualization team is working on new concepts and frameworks focusing on how to embed the nature lab in the region and link it to more than just the building of the former elementary school as well as discussing how to tackle everyday challenges.

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# Sport Risk Management Practices, Among Trainees

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# ABSTRACT

Competence of knowledge of risk management, among female coaches, can enhance organizational excellence in sports science and risk management approach to the sport. Competence development knowledge risk management coaches, it is important in the identification, evaluation and selection of operations in the sports industry to provide and ensure a safe environment for every sports program. Developed countries such as Australia and the United Kingdom were adopted, knowledge development model risk management standard. Model competency of knowledge of sports risk management can be helpful in controlling, preventing and minimizing the risk of accidents and injuries. This study was conducted to determine the competency of knowledge of risk management practices sports, among female teacher's teacher education institutes, in Malaysia. Risk management practices that were the identification, evaluation and selection operations. The study highlights the competency of sports knowledge of risk management practices, the dominant trainees. This review is for a review and a total of 62 respondents were teachers who were students at the Institute of Teacher Education. The findings of the analysis of the reliability and Cronbach alpha reliability individuals is 0.98 (very good) and the reliability of the item is 0-6 showed acceptable levels. After that the exact research by identifying competency knowledge of risk management practices in sport among trainee teachers and researchers determine the dominant factor based on the data analyzed using the Rasch model approach. The findings show that the competences of knowledge are at high level and the dominant element is the identification, selection and assessment operations.

Keywords: Competence Knowledge, Practice Manager, Risk Management Sports, Rasch model.

# INTRODUCTION

Excellence of educational institutions, including sports institutions can be seen depending on the extent to which the investment of resources, including human resources to increase their competitive advantage, try to increase with the approach of science and risk management that considers the management concept that the most after seeing the development of knowledge as an important presence in achieving the goals institutions in general and one of the rare and important for mankind in this big world, and consider the development of risk management knowledge among coaches to achieve a new, different and steady (Bafirman, 2014, Schwarz, Hall & Shibli, 2010).

Competency development knowledge of risk management coaches is the identification of acquisition, valuation sharing and selection operations of intelligence, understanding, and expertise in sports organizations to assist in the achievement of the tasks, processes and operations and increase the level of performance and competence through methods and different techniques (Hassan, 2014; Bafirman 2014; Schwarz et al, 2010; and Revilla et al., 2009). Development of risk management competency knowledge of sports is the identification, evaluation, selection and implementation of operations (Hronek and Spengler, 2002; Carpenter, 2000; Fuller, 1999; Mulrooney and Farmer, 1998; and Van der Smissen, 1990).

Competence development of risk management knowledge of sport, is the implementation of the supervision, implementation and execution of training activities/ sports program (Esa, 2014; Craig & Matthew, 2011; and Borkowski, 2010) to ensure a safe sports environment.

Many sports organizations in the world have placed emphasis on competence development of risk management knowledge and strive to improve the effectiveness and performance of their sports organization. Competence development of risk management knowledge, the basic concepts associated with the economy. Competence development of risk management knowledge among coaches rarely emphasized or valid in the community, but essential capabilities and abilities, and personal qualities to be effective in managing the risk of sports exploited to Asian countries such as Malaysia (Stenmark, 2002). According Ehsani and Veisi (2012) risk management practices is a matter that requires new qualified coaches to achieve good performance in risk management for the organization. Female's sports leaders and coaches must be educated in the field of sports and have the training and experience to competently manage risk.

Many experts in the development of risk management competencies sports knowledge among coaches have identified competencies risk management knowledge is a sport that needs identification, setting a goal of recording/ documentation and dissemination of knowledge (Heisig et al, 2001; and Gherardi, 2006). The study aims to determine the knowledge, competencies and skills required by coaches in the performance of duties. Studies such as these have become key research areas in sports management and has gained the attention of many researchers (Barcelona & Ross, 2004; Case & Branch, 2003; Horch & Schuette, 2003; Peng, 2000; Toh, 1997; Jamieson, 1991; Skipper 1990; Kim, 1997; and Lambrecht, 1987). Although the number of research activities in this field of study increased, researchers Toh (1997) and Lambrecht (1987) have stressed the importance of continuing competency assessments required to be implemented effectively in the sports industry's rapidly changing social environment.

Accidents often occur in sports and co-curricular programs. Therefore, female need to master level coach education related to knowledge about risk environments (Chen, 2012; Kim, 1997; Buttel & Flinn, 1978). We can also expect that the knowledge of the environment will be associated with the risk of environmental concerns (Schahn & Holzer, 1990). Hines, Hungerford and Tomer (1986) explain that the individual environmental knowledge will adopt the environmentally responsible. In terms of knowledge, attitude is intermediate variables, and there is a significant relationship between knowledge and actual behavior of self-reported behavior. Therefore, it is better to study the actual behavior rather than relying on behavioral measures alone reported (Kim, 1997). Knowledge competence development of female coaches expressed or implied contained in the individual mind and rely on the experience, skills, institutions and their capabilities in mind, it is available in the form of meaningful information (Hassan, 2014).

Knowledge management among coaches is one of the most innovative and important in increasing efficiency and competence perceptions of risk management in sports organizations. Female leaders need effective risk management competencies to the agreement, the investment capacity for knowledge and power in decision-making related to risk management of sports organizations use human resource capacity to achieve progress and prosperity.

Significant differences have emerged on how to construct knowledge of risk management. In societies forward we see even greater benefits in the development of the knowledge competency risk sports among coaches and the implementation of a higher level, and this interest is less in developing countries like Malaysia, as a topic that does not receive the interest payable from researchers in the field of sports in particular.

#### THE INVOLVEMENT OF FEMALE IN THE SPORT

The involvements of female in sport are very different from one people by another people as well as among female of a country with other countries. But in the context of world sports, it turns out that the involvement of female is very significant. Female have now been able to escape their commitments or constraints of culture or customs, social, political and religious. Now female athletes have contributed numerous successes in the sport just like the men. Female today play an important role in sports. They have their energy at all levels of sport. They are also active in the field of sports coaching, the development of young athletes, sports management and so on. In addition, female also run a variety of activities and sports facilities and equipment; also have been able to become managers and leaders in sports administration.



Franklin (2008), in the debate on female and physical training, sports and participation in the Olympic Games since 1965 the country has proven harmless sport or physical harm suffered by athletes. On the other hand the benefits of female is a lot better when involved in sports. Franklin (2008) stated that there is no need to create the impression that if female were involved in a physical event, they will look like a man and not feminine. Physical activity is not a threat to femininity or feminine but should be part of its development process.

Due to the many negative responses on female in sports psychology there arises conflict on female. However Snyder and Spreitzer (1978) has shown that the gymnasts have a good psychological well-being. Kane and Greendorfer (1994) in his study stated that personality famous tennis players have a good level of emotional stability, ego strength and have a low frustration level. There are no proven occurrences of loss of feminine traits.

Physical education began to grow and learn to young female of the movement is graceful arms, hands, and head of the movement with music and physical exercises (Lee, 1983). Many private schools for girls have developed a rich curriculum of physical education consisting of activities such as swimming, running, cricket, archery, dance, gymnastics, and horseback riding (Lee, 1983). Until 1833 the academy and seminar for female is the highest learning situation for female, but the inclusion of female remains low in spite of institutional admission requirements does not require any qualification / training (Lucas, 1994). According to Lucas (1994), Oberlin College is one of the first to open its doors to both men and female (Lucas, 1994; Solomon, 1985). Oberlin has been considered a pioneer in educated female three female awarded a Bachelor of Arts in 1841 after the girls have completed the same course of study nine men (Lucas, 1994). From 1880 about one-third of colleges and universities in the United States have implemented some form of physical education and sports between men and female (Lucas, 1994). However, many men and female believe in the need to maintain separate spheres of society and they think education with an aberration (Solomon, 1985).

Disobedience to physical education in mixed classes can be traced back to the ideas of the glory of the nineteenth century femininity as "purity, piety, submission, and household and expectations that attend college will corrode or affect the properties of the feminine" coeds "(Lucas, 1994, p. 205). Those who support same-sex schooling is often cited their concern for young girls and their exposure to the roughness of small boys (Urban and Wagoner, 1996). However, girls were taught to conduct themselves as young female and with the correct traditional gender roles have been strengthened not challenged in the classroom mix (Urban and Wagoner, 1996).

The nineteenth century ended, growth and much progress has taken place in elementary schools and colleges in the United States. It is estimated that less than one per cent of young female in the United States have attended college in 1870 have not yet twenty years later the number had risen to only 2.5 per cent (Lucas, 1994). Female, for the most part, are not allowed to participate in extracurricular activities sponsored by universities such as clubs, debating societies, music groups, or social and academic honoraries (Lucas, 1994). However, in 1887 a department of physical education in high school was established in Philadelphia, which was the first department of physical education for girls who have special teachers in the public high school in the United States (Lee, 1983). And, around the college in 1898 and more female began to participate in basketball competitions between education institutions and secondary schools participated in basketball competitions Interscholastic (Lee, 1983). It seems to open the way and the opportunity for female to grow academically and in sports.

# BACKGROUND

A significant factor in influencing the performance of athletes among coaches (Harter, 1981; Horn, 1985; and Weiss, Ebbeck, McAuley and Weise, 1990). 1981 Harter theory explains that the practice of coaches in identifying risk is a significant element in the development of behavioral performance athletes. athletes who receive a consistent evaluation or consistent and positive than coaches will be able to develop competencies and personal capabilities and athletes improve athletic performance (Harter 1981). This means that coaches who are competent to carry out risk management practices can improve sports performance athletes in the sport and vice versa. They are supported by Smith, Smoll and Hunt (1989), Sander (1981) and Weiss (1987), stating that the behavior of coaches affect cognitive perception and attitude towards the competition athletes in sports competitions.



According to Rothe (2009), the competence of knowledge of risk management practices are among the methods to prevent and protect against problems and can be used to serve as a guideline in the present and future. This knowledge led to the competence of the aspects of prevention, protection and security to the school free of negative elements (Abdul Razak, Ismail and Panting, 2009; Che Lan, 2012) such as injury during sports programs. Most of the risk management model in the range of risk management of the building, transportation, environment and business (MOE, 2012; Nurman, 2011; Bakhtiar, 2008; HIRARC, 2008; MIROS, 2007; Mohd. Amin, Abdul Ghani and Ab. Latif, 2005; MOE, 2002; Mukhtar, 2001). However, the competence of knowledge of risk management practices of female sports teachers is less emphasized. According Thye (2010), the school management and the Department of Education, which represents employers, has a general responsibility for ensuring the safety and welfare of teachers and support staff, as well as protect students, teachers and visitors.

#### PURPOSE OF THE STUDY

This study was conducted to determine the competence of knowledge of sport risk management practices among female trainees (CK-SRMP-FT), teacher education institutes (TEI) in Malaysia. Risk management practices that were the identification, evaluation and selection operations.

#### **OBJECTIVES**

This research aims to achieve the following objectives:

- i. Identify the CK-SRMP-FT, TEI in Malaysia.
- ii. Identifying competencies risk management practices for the sports dominant female trainees.

#### **CONSEPTUAL FRAMEWORK**



Figure 1: Conceptual framework

#### METHODOLOGY

This study was a survey done by identifying the research problem, define the objectives and scope of the study.

#### POPULATION AND SAMPLE

The study population for this research consists of teachers, are under study ITE across Malaysia, which has been selected as athletes representing the ITE, in sports SIPMA. Respondents in this study were 62 trainees have been selected for SIPMA. Because only 62 trainees were involved in SIPMA, researchers use purposive sampling method as described by Tenebaum and Discoll (2005). Researchers have used the entire population of trainees have been selected for SIPMA because the sample meet all the demands and requirements of the study.



#### **INSTRUMENT**

The researchers used questionnaires as an instrument for identifying competencies of knowledge of risk management practices sports, for female ITE student teachers in Malaysia. These instruments are validated using the Rasch model approach could consolidate the validity and reliability of the instrument. The findings of the analysis of the reliability and Cronbach alpha reliability individuals is 0.98 (very good) and the reliability of the item is 0-6 showed acceptable levels. According to Bond and Fox (2007) and Linacre (2004), the validity and reliability of the instrument is very important to maintain the accuracy of the instrument prone to defects. The higher the value and reliability level, the more accurate the data obtained in order to produce good research and good quality.

# DATA ANALYSIS

In this study, quantitative data were analyzed using the software Winsteps with fully Rasch model approach. According to the Rasch (1980), Rasch measurement model is a model that formed as a result of the measurement that takes into consideration the ability or the ability of the respondents who answered questionnaires, tests or instruments. Analysis was done by looking at the mean score. According to Wiersma (2000), the mean value obtained is used as a yardstick to determine whether learning methods identified to be at high level (3.81-5.00), moderate (2.41-3.80) or low (1.00-2.40).

# RESULT

Table 1: Analysis of the level of trainees approval to the overall competence of sports risk management.

Label	Competence of knowledge	Mean Score	Level
CKI	Identification	4.26	High
CKA	Assessment	4.20	High
CKS	Selection Operations	4.25	High

 Table 2: Analysis of the level of trainees approval, the competence to the identification of sports risk management.

Label	Competence of identification	Mean Score	Level
CKI-LT	Liability and Torts	4.30	High
CKI-EF	Equipments and facilities	4.21	High
CKI-DC	Demographis Coach	4.30	High

Table 3: Analysis of the level of trainees approval, the competence of sports risk management Assessment.

Label	Competence of Assessment	Mean Score	Level
CKA-PC	Professional Circulars	4.10	High
CKA-ID	ISO documents	4.15	High
CKA-ERP	Existing Risk Practice	4.26	High

 Table 4: Analysis of the level of trainees approval, the competence of selection operations sports risk management.

Label	Competence of selection operations	Mean Score	Level
CK-C	Communication	4.28	High
CK0-T	Technology	4.17	High
CKO-EMT	Emergency Management and Transportation	4.27	High



#### DISCUSSION

Based on the analysis, the respondents agreed with all CK-SRMP-FT listed in the questionnaire. Respondents were trainees from Institute of Teacher Education in Sports Education Institute Malaysia 2013. They give high approval to construct practice identification, followed by the selection and evaluation of operations. The findings are in line with Fuller (2007), Van de Smissen (2005), and Kaiser 1986. Risk management practices construct the identification, evaluation and selection of critical operations to recognize and implement the most effective approach for managing the various risks.

Results show that the respondents agreed with the highest level of the identification of appropriate constructs is practiced, namely liability and tort, equipment and facilities, and faculty demographics. This finding is in line with Van de Smissen (2007) which states that the identification is an on-going process. Mulrooney and Farmer (1998) explains that the identified equipment, facilities, and the demographics of the coach is to prevent and avoid liability and tort actions in the sports program. Hasley (2012) and Tillman et.al (1996) explains that the use of proper equipment and facilities, lockable storage for all the equipment and facilities that are not used are among the strategies that are effective in managing risks. Stephen and James (2012) and Hasley (2012) also emphasizes on a hired coach must be qualified to teach, supervise, comply with regulations and proper risk management procedures.

CK-SRMP-FT through the selection operations of constructs communication, technology, transportation and emergency management approved the second highest of the respondents. The finding is consistent with studies Hasley (2012) and Hronek and Spengler (1997) which states that communication through proper instruction and selecting appropriate activities and surveillance is an important element in the risk management process. Proper instruction by coaches and sports teachers in the program not only helps ensure the safety and welfare of the students but also serves to eliminate the negligent behaviour of the individuals involved. They are supported by Stephen and James (2012) stating the need to undertake a risk monitoring system is operating in either manual or tech in any activity or program participation sport. Attarian (2012) explains that all sports programs must develop basic criteria and technology communication devices such as cellular or satellite phones that are suitable for use as emergency notification or response management consulting, medical or behaviour, in transport logistics and safety program.

The results of analysis of construct assessments SPRM via profesional circular , the ISO and the inherent risk warning also gained a high level of agreement of respondents. This finding is in line with Hasley (2012) and Langley and Hawkins (1999), which stressed that the organizers of events need to be aware of the status of the participants at all times and foresee the potential risks that can occur through selected activities. Coaches also need to enlighten students about the risks behind the activities of certain sports. Van Der Smissen (1990) explains, the organization must have a circular base and a standard as a reference and guide trainers to mitigate and control risks in the sports program. Hasley (2012) and Stephen and James (2012) states, through training programs, risk management, particularly in physical education, problem solving can be done effectively. It is associated with the process of making decisions about personal ability to be an important element to coach in coaching skills to anticipate the risks that may arise from certain sports activities. According Hasley (2012) and McGregor and Associates (2000), the administrator responsible for hiring qualified coaches and ensure that they are properly trained, that all coaches must attend workshops and conferences related duties.

#### CONCLUSION

Trainee teachers should be competent in risk management practices while on duty to carry out sports activities or certain sports program. Respondents agreed that competency knowledge of risk management practices appropriate to the sport practiced by trainees TEI according to the dominant construct is the identification, selection operation, and evaluation. Competence Knowledge of sports risk management practices of trainees can improve sports programs secure environment and add value to national sports organizations.

#### ACKNOWLEDGEMENT

This study was supported by Fundamental Research Grants Scheme (FRGS) vot 1555, Universiti Tun Hussein Onn Malaysia.



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# Students' Conceptual Understanding and Achievement in Algebra Using Mathematical Patterns

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# ABSTRACT

The purpose of this study was to determine the influence of mathematical patterns on the student's performance in terms of conceptual understanding and achievement in college algebra and their perception towards the use of mathematical patterns. The study used the pretest-posttest quasi-experimental-control group design. Two sections were randomly chosen from the five sections that were officially enrolled in the first semester of school year 2014-2015. One group was randomly assigned as the control group and the second one as the experimental group. The control group had undergone the lecture-discussion while the experimental group underwent mathematical patterns. The study used three instruments: Mathematics Achievement and Conceptual Understanding Tests and the Interview Guide Questions. The performance of both groups of the students in the pretest and posttest were described in terms of the mean and standard deviation. The analysis of covariance (ANCOVA) was used to determine the effect of two teaching methods. Based on the analysis of the study, the results revealed that there was a significant difference in the student's achievements and conceptual understanding scores as influenced by the teaching method which is the use of mathematical patterns. Furthermore, he students in the experimental group expressed that mathematical patterns was enjoyable and interesting because it allowed them to develop their critical thinking and made mathematics learning easier for them. Based on the findings of the study, the researcher concluded that the use of mathematical patterns is an effective method of teaching in improving students' achievement and conceptual understanding. The researcher recommends that mathematical patterns may be used by mathematics teachers in their classes to help improve achievement and develop conceptual understanding even to pre-school, elementary and secondary levels. Keywords: mathematical patterns, achievement, conceptual understanding

# INTRODUCTION

Many students at the present are unable to continue college education after completing high school due to financial instability, early marriage and other family issues. Based on the initial investigation and interviews, many of the students who are enrolled in St. Rita's College of Balingasag come from the colleges and universities of Cagayan de Oro City, citing financial constraints as one of the major reasons for this move. In addition, the students' profile show that some are drop outs, transferees and some have started college education late due to the same reason mentioned earlier.

Learning mathematics requires a continuous process of acquisition of knowledge and critical thinking skills. Knowing the present set of students, acquisition of mathematical concept may be interesting and enjoyable if done through investigation of patterns that requires them to think deeply and critically for better conceptual understanding. This is necessary because of the abstract nature of mathematics.

The patterns studied by mathematicians are for all practical purposes and as real as atomic particles studied by physicist (Fi, Degner, 2012). Pattern recognition is a critical component of success in mathematics. Students at all levels may be provided with opportunities to investigate and uncover patterns throughout their mathematical careers to allow them to explore situations because pattern recognition plays a vital role in the construction of important mathematical model (Quinn, 2005).

Moreover, the use of patterns is important in the abstraction of mathematical ideas which involves observation, representation and investigation of arrangements and relationships in social and physical phenomena and between mathematical objects themselves (Waters, 2004; English, 2004). It is essential for students to learn the nature of mathematical patterns for the development of spatial awareness, sequencing and ordering, comparison and classification of ideas. Thus, the development of pattern – based thinking, the use of patterns to analyze and solve problems is an extremely powerful tool for doing and understanding mathematics.

In addition, the world trend for quality instruction is increasing because of global competitiveness. This requires high cognitive demand mathematics instruction because the National Mathematics Advisory Panel (2008) has noted that the differences in instruction lead to significant differences in student's achievement. Thus, the importance of high quality instruction that model a critical thinking classroom learning process is very necessary. The high cognitive demand instruction requires teachers who could design a comprehensive and engaging teaching – learning environment which uses effective visuals to help learners with a wide variety of learning styles to develop a strong conceptual understanding of mathematical concepts (Galvez, 2009) through patterns.

The use of patterns have shown promising effect on students' achievement which challenge the researcher if it will work among college students in St. Rita's College of Balingasag, hence, this research.

# LITERATURE REVIEW

# **Mathematical Patterns**

The Open University (1988) website stated that imagery is a powerful force for perception and understanding. Being able to "see" something mentally is a common metaphor for understanding it. An image may be of some geometrical shape, or of a graph or diagram, or it may be some set of symbols or some procedures. This means that if you really want to grasp a concept or idea, struggling to visualize is worthwhile. Diagrams or symbols on paper, or physical apparatus are of help. Image of geometrical shape among mathematical models use patterns. The geometric setting for many pattern problems is a sequence of two-dimensional shapes, which is ideally suited to support the recognition of algebraic patterns. Thus, geometric problems help students progress from predicting numerical patterns to expressing algebraic generalizations (Beigie, 2011).

Witzel (2003) and his colleagues conducted a study on students identified as having difficulty in learning algebra. The study found out that student who learned how to solve algebra transformation equations through concrete – pictorial approach (CPA) scored higher on post instruction and follow-uptests than the control peers receiving traditional instruction. Furthermore, students who used the concrete-pictorial approach sequence of instruction performed fewer procedural errors when solving for algebraic variables. This study has bearing with patterns.

Thornton (2001) points three reasons to re-evaluate the role of visualization in school mathematics: (1) mathematics is currently identified with the study of patterns; (2) visualization can often provide simple and powerful approaches to problem solving; and (3) teachers should recognize the importance of helping students develop a repertoire of techniques to approach mathematical situations.



Beigie (2011) found out in his study on the leap of patterns that geometric counting problems offer students a concrete and pictorial setting to follow the abstraction process from number patterns to algebraic expressions. It also allows them to solve problems because the underlying geometry is assisting the algebraic steps. He added that pattern recognition through counting lies at the foundational heart of algebraic thinking and geometric measurement and connects the two topics in a way that reinforces one another.

Latonio (2006) recommended in his exploratory study on students' learning readiness of algebra that the mathematic curriculum need to be expanded to include pattern recognition and extension which entail strategies other than counting. Furthermore, relations between objects and numbers need to be focused while the concept of the unknown need to be introduced through varying symbols used in arithmetical expressions and sentences.

The ability to evaluate numerical expressions using patterns and relationships is fundamental if students are to move from merely exploring patterns withy finite cases to describing patterns with symbols. This is a key element of making a successful transition from arithmetic to algebraic reasoning. Pattern exploration task gives the students opportunities to apply he algebraic rules and properties to familiar numerical expressions (Lo and Tsai, 2011).

Pattern exploration tasks may contribute to the development of abilities related to problem solving, through emphasizing the analysis of particular cases, organizing data systematically, conjecturing and generalizing. The Principles and Standards for School Mathematics (NCTM, 2000) acknowledges the importance of working with numeric, geometric and pictorial patterns. Thus, instructional mathematics programs should enable students to engage in activities involving the understanding of patterns, relations and functions (Barbosa, et al., 2007).

The focus on pattern exploration is frequent in the recent approaches o the study of algebra. The search for regularities in different contexts, the use of symbols and variables that represents patterns and generalization are important components of the mathematics curriculum in many countries (DEB, 2001). Working with patterns may be considered a unifying theme of mathematics teaching, appearing in different contexts and contributing to the development of several concepts (NCTM, 2000). In this research, the use of pattern exploration tasks has the main purpose of setting the environment to analyze the impact of the use of visual strategies in generalization.

Patten generalization has become an important feature of mathematics classrooms around the world. Sometimes these activities focus purely on given numerical terms, but the use of pictorial and figural patterns is now becoming part of the standard repertoire for such generalization exercises. From a pedagogic point of view, the investigation of pictorial patterns potentially allows for a meaningful way of arriving at and exploring algebraically equivalent expressions of generality. Thus, teachers still need a tool box of pedagogical strategies which they can draw on to encourage visual engagement with the pictorial context. Also, teachers should encourage visual engagement with patterning activities presented in a pictorial context (Samson, 2012).

Awareness of Mathematical Pattern and Structure (AMPS), which generalizes across mathematical concepts, can be a reliable measure and is correlated with general mathematical understanding (Mulligan and Mitchelmore, 2009). Because the concrete experience that these objects provide, it allows students o have a greater understanding of mathematical concepts which becomes the basis of their conceptual mathematical knowledge.



Cockcroft (1995) summarized that mathematics teaching at all levels should include opportunities for: a) exposition by the teacher, b) discussion between teachers and students, c) discussion among students, d) appropriate practical work, e) consolidation and practice of fundamental styles and routine, and f) problem solving investigation. The idea of Cockcroft is related to the present endeavour since the nature of patterns is similar to investigation process.

## **Conceptual Understanding and Achievement in Mathematics**

The Common Core Standards in Mathematics (CCSM) stressed the importance of conceptual understanding as a key component of mathematical expertise. One hallmark of mathematical understanding is the ability to justify, in a way appropriate to the student's mathematical maturity, why a particular mathematical statement is true or where a mathematical rule comes from (Wiggins, 2014).

In the analysis of college students' performance at Divine Word College of Vigan, Cajindos (2010) recommended that there should be a thorough explanation of the subject matter through remedial classes for students. Teachers should be inspired and should motivate the students to love the subject to strengthen the attitude towards the subject. The teachers should also be updated with the recent trends and techniques in teaching mathematics to help improve students' conceptual understanding.

Ben-Hur (2006), Steffe and Thompson (2000) posited that learning mathematical concepts involves reflection. Learning new concepts starts from sharp perception and ends in the independent ability of application. This concept is somewhat related to learning by doing on which activities may be done by students after the concept is introduced. In patterns, to learn mathematical concepts and connect the previously learned concept to new situation needs reflection.

In the study of Tsai (2010) about the epistemological relationships on students' beliefs and perceptions of constructivist learning environments where they could (1) interact and negotiate meanings with others, (2) integrate their prior knowledge and experiences with newly constructed knowledge, and (3) meaningfully control their learning activities. The main thrust of the findings drawn from this study indicates that teachers need to be very aware of students' epistemological orientation towards their mathematical knowledge and conceptual understanding to be able to complement these preferences when designing learning experiences, especially to provide constructivist-based lessons to enhance mathematics learning for students who are epistemologically constructivist oriented. The use of pattern in teaching is a constructivist – based approach, and may be of help in improving the students' conceptual understanding.

Mathematics achievement is an assessment of performance to evaluate learning after giving instruction. Lambitco, et al. (2007) conducted a study to determine what factors affect students' achievement in college algebra. The results revealed that students achieve less in mathematics because it is regarded as a difficult subject and is abstract in nature. Their foundation in high school mathematics needs to be really good in order to be ready for college work. The students' mathematical ability must be high in order to obtain good performance in college algebra because learning mathematics is directly related to mathematical ability. They did not obtain the required mastery in the mathematical concepts, which they needed to possess upon entering college. The teaching methodologies related to the students achievement and mastery of mathematical concepts, thus using patterns in teaching may be appropriate for concept building.

Quimbo (2003) believed that education includes measures of the home learning environment and school inputs appropriate at the students level. Results suggest that by effectively providing basic learning materials in schools can help improve the mathematics achievement in the present endeavor as well as future life activities.



The Principles and Standards for School Mathematics recommended the use of materials in mathematical problem solving (NCTM, 2000). Japona (2000) also mentioned that teachers who teach with materials bring life to the students. It can reinforce, if properly motivated, on the students' achievement in understanding the abstract nature of mathematics. If students lack understanding of concepts, they are unlikely to construct the desired algebraic ideas. In his study on visual approach in teaching, it was revealed that visual approach was more effective in increasing g students' achievement than the traditional approach. The use of patterns is related o visual approach as a material in teaching mathematics because it includes pictures or images which will be observed by the students and discover the algebraic concept behind.

In addition, the study of Dadole (2007) on the use of structure representations revealed that the achievement scores of students who used structured representations were as good as students who did not use the faction strips. However, it has a significant effect on the retention scores of the high school students in mathematics. Patterns, like structure representation is another type of material which is used in teaching to help improve students' achievement and understanding.

Furthermore, in the study using a manipulative model conducted by Agot (2013), it showed that the use of model is better than that of the lecture – discussion method because it facilitates higher order thinking skills and provides students with high content knowledge, which is an effective and feasible option for teachers. The use of manipulative promotes high mathematics achievement among students since it can provide useful and concrete base in doing symbolic work including the equivalence of algebraic expressions. Manipulative models are like patterns. Only, his models are concrete while patterns use pictures, drawing, sketch and illustrations.

# Perceptions

Algebra uses symbols for generalizing arithmetic. These symbols have different meanings and interpretations in different situations. According to Kieran (1992), students have different perceptions about these symbols, letters and signs. The study has revealed that the problems encountered by the students appeared to have connection with their lack of conceptual knowledge and it might have been result of teaching they experienced in learning Algebra at the secondary schooling level. In patterns, students encounter symbols and signs where perception is measured. This gives them opportunity to make connections from their previous understanding to the present.

Amoo & Rahman (2004) said that students' participation in the instructional process is critical and their perception presents methodological challenges. The knowledge of the way the students think and perceive can aid the teacher to reflect upon and adjust the teaching strategies to enhance students' understanding and achievement. Perception is the way the student's judge, or it is an attitude to an idea or object which determines what they think feel and behave towards that idea or objects. His has something to do with a disposition to act or react in a particular way as the students respond to a situation. In this study, students were asked to give judgment about their experiences with the use of patterns.

Kershner &Pointon (2002) pointed out that students' perceptions of appropriate practices that enable them to succeed in learning mathematics were identified through the use of interviews. Listening to the teacher was recognized as a key practice. These students noted that listening to the teacher was important when the teacher was introducing a new topic, explaining something difficult or giving instructions about a set task. They recognized that to be successful in learning mathematics there is a needed to do more than just listening to the teacher. In patterns, the students give their views about its usage and importance inside the classroom based on the given guide questions.

A study by Campbell, et al., and Haas (2002) showed that teaching strategies had influenced students' perceptions. Students with deep approaches to learning generally demonstrated a more sophisticated understanding of the learning opportunities offered to them than those students with surface approaches. When teachers focused strongly on actively engaging students and creating a supportive environment, the students with both deep and surface approaches focused only on the student - centered aspects of the class.

In contrast, when traditional expository teaching methods were used exclusively, students with deep and surface approaches both focused on transmission and reproduction. In using patterns, students are deeply engaged, thus creating a student – centered classroom.

## Summary

Some of the studies mentioned in the previous pages were related to the present endeavor which was about mathematical patterns as a teaching strategy. A teaching strategy influenced student's achievement, perceptions and conceptual understanding in the study of Kieran (1992); Japona (2000); Campbell, et al. and Haas (2002); Quimbo (2003); Dadole, Lambitco, et Al. (2007); Cajindos &Tsai (2010).

A pattern uses visual imagery like geometrical shapes, numbers, symbols, graphs or diagrams. This is a powerful tool to help improve student's progress in perception and understanding as revealed in the research of The Open University (1988) & Beigie (2011). This is a necessity in forming mathematics concept which is possible when students are encouraged to analyze and visualize mathematical situations and structures using patterns (Thorton, 2001; Schulz 2011; and Vinogradova, 2010).

Through pattern exploration task, students are given opportunities to describe patterns with symbols, determine the relation between objects and numbers, and solve problems which may guide them in the successful transition of arithmetic and patterns to algebraic reasoning (NCTM, 2000; DEB, 2001; Latonio, 2006; Barbosa, et al., 2007; and Beigie, Lo & Tsai 2011). Thus, according to Samson (2012), pattern generalization is very important in the mathematics classroom.

# RESULTS

Table 1. The Mean and Standard Deviation of the Students' Achievement Test Scores

	Control Group		Experime	Experimental Group		
	Pretest	Posttest	Pretest	Posttest		
Mean	4.29	8.02	4.03	9.55		
Standard Deviation	2.83	3.25	2.88	3.23		

Table 1 shows the mean and standard deviation of the pretest and posttest scores of the students' achievement. In the pretest, the mean of the control group is 4.29 while the experimental group is 4.03. This means that the students had low scores since the test had 20 items. This could be because they had not remembered what had been discussed during their high school algebra. It could be observed also that the mean of the control group is a little higher than that of the experimental group. In the posttest, the adjusted mean of the control group is 8.02 while the experimental group is 9.55. it can be seen that the experimental group has greater increase than the control group, although it has not reached 50% of the total number of items which is equivalent to 20 points. To determine if the method of teaching had an effect on the students' achievement, the analysis of covariance was used.

Furthermore, in the pretest, the standard deviation of the control group is 2.83 while that of the experimental group is 2.88. The results reveal that the students in both groups had dispersed scores. In the posttest, the standard deviation of the control group is 3.25 while that of the experimental group is 3.23. The standard deviation of the control group is greater than the experimental group and both groups have increased and the scores become more dispersed. This means that the students' scores of the control group were more heterogeneous than the experimental group because some had very low and others had high scores. Thus, the students in the control group because more heterogeneous after the treatment.

Source of	Adjusted Sum of		Adjusted	F	p-
Variation	Squares	df	Mean Squares	Computed	Value
Treatment	35 36	1	35 36	7 73	0.007*
	55.50	1	55.50	1.15	0.007
Error Within					
	269.84	59	4.57		
Total	305.2	60			

# Table 2. The Analysis of Covariance of Students' Achievement Test Scores

\*significant at p<0.05

Table 2 presents the result of the analysis of covariance of the pretest and posttest scores of the control and experimental groups. The analysis yielded an F – ratio of 7.73 with a P – value of 0.007, which is less than the critical value of 0.05 level of significance. This led to the rejection of the null hypothesis that there is no significant difference in the students' achievement scores as influenced by the teaching method. This implies that the use of mathematical patterns had significant influence on the students' achievement. This means that the adjusted posttest mean score of the experimental group which is 9.55 is higher than the posttest mean score of the control group which is 8.02. This implies that using patterns in learning the concepts of functions, sequences and series had significant effect in the students' achievement scores. This finding shows that pattern could effectively provide development of conceptual understanding and supports Quimbo's (2003) study which claimed that the use of mathematical patterns, have help students improved their mathematics achievement.

Table 3. The Mean and Standard Deviation of Students' Conceptual Understanding Test Scores

	Control Group		Experimental Group		
	Pretest	Posttest	Pretest	Posttest	
Mean	3.13	9.20	2.10	9.88	
Standard Deviation	2.26	2.01	1.80	2.68	

Table 3 shows the mean and standard deviation of the pretest and posttest scores of students' conceptual understanding. In the pretest, the mean of the control group is 3.13 while the experimental group is 2.10. It can be observed that the mean score of the control group is higher than that of the experimental group. This means that the students from both groups showed only a little knowledge on the concepts of functions, sequences and series where they were expected to explain or justify their answers because the total number of points was 25. The control group achieves only 12.5% of the total test points while the experimental group is 9.88. The results reveal that the experimental group had greater increase in their mean score than the control group, although it has not reached 50% of the total points. To determine if there was a significant effect of the method of teaching on the students' conceptual understanding, the ANNOVA was used for further analysis.

Meanwhile, the standard deviation of the control group is 2.26 while that of the experimental group is 1.80. This indicates that the experimental group had less dispersed scores compared to the control group. But in the posttest, the standard deviation of the control group is reduced to 2.01 while that of the experimental group, it has increased to 2.68. The standard deviation of the experimental group is greater than the control group. This means that the students' scores of the experimental group became more dispersed compared to the control group. The experimental group became more heterogeneous after the treatment.

Source of Variation	Adjusted Squares	Sum	of	DF	Adjusted Squares	Mean	F- computed	p-value
Treatment	13.04			1	13.04		4.27	0.043
Error Within	180.04			59	3.05			
Total	193.08			60				

#### Table 4. The Analysis of Covariance for Students' Conceptual Understanding Test Scores

Table 4 shows the result of the analysis of covariance of the pretest and posttest scores of the control and experimental groups. The analysis yielded an F – ratio of 4.27 with a P-value of 0.043, which is less than 0.05 level of significance. This led to the rejection of the null hypothesis that there is no significant difference in the students' conceptual understanding as influenced by the teaching method. This implies that the use of mathematical patterns had influenced the students' conceptual understanding on the topics included in the study. This implies further that working with patterns was a good method of teaching in mathematics because the students' scores in the experimental group had improved. This means that the posttest conceptual understanding of the experimental group of 9.88 is higher than the control group with a mean score of 9.20. This explains that the use of mathematical patterns in class had helped developed a good conceptual understanding of the students on the lesson discussed.

Student's Responses to the Question "How will you describe your experience using mathematical patterns?"

Learning mathematics through mathematical patterns is done through investigation, which means that students will observe and think of the connections between numbers, pictures and figures. Based from these observations, the students will develop a model which represents the whole problem. The following were the students' learning experiences:

a.) Math is fun.

Learning mathematics for many is neither easy nor fun. However, learning mathematics with the use of mathematical patterns caught the students' interest. Thus, the students find joy in doing problem solving.

- It is enjoying.
- I am just like playing while making connections of the data provided.
  - b.)Math needs tool.

Imagery is a powerful tool for perception and understanding. The use of mathematical patterns used images and figures that help bridge the concrete nature of mathematics to abstract. This means that the students learn mathematics slowly through self-observation, discovery and analysis. It helps me think well because the classroom atmosphere is silent. At first I just laugh because there is less talk from the instructor but it helps me understand the discussion. It is more or self-discovery and analysis. But I realize that there is a great advantage in thinking by myself and be able to share my own understanding to my seatmate.

The students enjoyed the activity with the use of patterns and enable them to think deeply because they were given time to think and analyze. This implies that the use of patterns was really effective in improving students' performance.

Table 5. Students' Responses to the Question "Do you think the use of mathematical patterns would be of help to other learners? Why?"

Responses	Frequency	Percentage
Yes	20	64.52
No	11	35.48
Total	31	100



Table 5 presents the students' belief in the usefulness of mathematical patterns in learning mathematics for other learners. More than sixty percent (64.52%) of the total participants believed that mathematical patterns were of help to other learners while thirty five percent (35.48%) did not believe that it was useful to other learners. This indicates that majority of the participants believed that the use of mathematical patterns would be of help to other learners.

The use of mathematical patterns was found effective in improving students' performance. It was recommended to other learners because it is helpful in developing new skills which is useful in the formulation of new concepts and ideas.

# a.) Critical Thinking

- The use of mathematical patterns helped develop students' critical thinking and analysis of practical problems. And given enough time to perform the task, students may be able to perform better.
- Yes, because it allows us to improve our own thinking by ourselves.
- Yes, but maybe if they are given enough time. The time is very short.

# b.) Conceptual Understanding

- Mathematical patterns helped improved the students' conceptual understanding. Conceptual understanding is the key component of mathematical expertise. This is the ability to justify, in a way appropriate to the students' mathematical maturity.
- Yes, because they may learn the way I learn and it might be easier for them to understand the topic.
- Yes, but not sure, students are different.
- Yes, because our previous understanding from high school was activated and able to connect from it.
- Yes, because the basic was used to help us understand the concept of algebra.
- Yes, because it might be difficult for us, but for them it would be easier and they can learn better.
- Yes because we are allowed to explain our ideas and present to our classmates.

However, there were some who did not believe in the ability of mathematical patterns to help other learners because of its content difficulty of the activity and due to less classroom discussion.

- No, because it is very difficult for a learning to take place without the constant talk and discussion of the teacher about the lesson.
- No, because I don't even get it myself how much more the other students.
- No, because we are expected to answer even if we don't have any discussion yet.

Majority of the students' responses indicated that the use of patterns was of help to other learners because it was also of help to them as shown in table 7. Thus, the use of mathematical patterns, which allowed students to become part of the learning process, was commendable to other learners.

# FINDINGS

Based on the analysis, the following are the findings:

- a)There is a significant difference in the students' achievement and conceptual understanding scores as influenced by the teaching method which is the use of mathematical patterns. The students in the experimental group who were taught using the mathematical patterns performed better than the control group where lecture discussion method was used.
- b) The students in the experimental group find mathematical patterns enjoyable and interesting, which allows them to develop their critical thinking and make mathematics learning easier for them. In addition, students believed that the use of mathematical patterns id helpful and useful in understanding mathematical concepts not only for themselves but also for other students.


#### **Conclusions and Recommendations**

This study concluded that the use of mathematical patterns have caused better students' achievement and conceptual understanding than the lecture – discussion method and it is an acceptable method of learning by learners.

The researcher then recommends that mathematics teachers may use mathematical patterns in their classes to help students improve achievement and develop conceptual understanding in mathematics even for pre-school, elementary and secondary level. School administrators may motivate mathematics teachers to use mathematical patterns for classroom instruction especially in pre-school, elementary and secondary levels where all foundations of mathematics were first discussed. School administrators should expose mathematics teachers to the use of mathematical patterns through in-service training and similar studies may be conducted by other researchers who wish to investigate the use of mathematical patterns in the classroom considering other factors like student's mental ability, academic level, other disciplines and increase of time span of the study.

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# Students' Image of Science and Scientets: Kocaeli Vocational School Sample

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## ABSTRACT

Students' images of science and scientists may be one of the most stable fact that learned at school. In this study, we investigate vocational school students' images of science and scientists, with an analysis of how those images may be influenced by science textbooks. A modified Chambers' Draw-a-Scientist Test (DAST) was applied to 120 students from different programs as accounting, business management, chemistry and construction technology in Kocaeli vocational school. Results showed that technical programs students drew more indicators (i.e., lab apron, eyeglasses, facial features, research and knowledge symbols, and) than did social programs students. An analysis of individual drawings revealed an increase sophistication in technical programs' favor. It was found that students images considerably similar to what their textbook presented. As a result, it can be said that the textbooks have some degree of influence on students' image of science and scientists. **Key words**: image of scientist, vocational school, Draw-a-Scientist Test (DAST)

#### **INTRODUCTION**

Students' image of science and scientists could be more stable and resistant to change than most other scientific knowledges learned at school (She, 1995). The main reason of this difference can be the combination of various influences at school, such as textbooks, teacher behavior, teacher personality, and science teacher gender (Sjoberg, 1993). Additionally, watching a wide range of television films, and searching of many academic web page and videos in the net. Mead (1957) conducted the first systematic investigation of standard images that students and instructors hold of science and scientists; The first systematic investigation of standard images that students hold of scientists was conducted by Mead and Metraus (1957) who asked student subjects to respond to open-ended statements designed to uncover both personal and impersonal images of scientists: "The scientist is a man who wears a white coat and works in a laboratory. He is elderly or middle-aged and wears glasses ..., he may wear a beard ...he is surrounded by equipment: test tubes, Bunsen burners, flasks and bottles ... and weird machines ... One day he may straighten up and shout: "Tve found it I've found it t ! "



... Through his work people will have new and better proudest..., he has to keep dangerous secrets ..., his work may be dangerous..., he is always reading a book."

The basic characteristics of these popular stereotypes remained fix between 1945 and 1975, also this image had changed little since the beginning of the century, though his own research focused only on the post-war period was noticed by Basalla (1976). Later, Krajkovieh and Smith (1982) developed a 29-item Likert-type Image of Science and Scientists Scale based on Mead and Metraus's earlier instrument to measure these images in a more detailed version. In this study, a major drawback of both tools was their requirement of advanced reading and writhing skills, which restricted their use to older subjects.

An important and efficient test called Draw-a-Scientist Test based on the presence/absence of seven indicators in a subject's drawing of a scientist: lab coats, eyeglasses, facial features, research symbols, knowledge symbols, technology, and relevant captions was developed by Chambers (1983). He applied this test to analyze drawings made by over 4800 children in Canada, Australia and the U.S. The test test has also been used by Schibeci and Sorensen (1983), Schibeci (1986), and Maoldomhnaigh and Hufit (1988) to assess primary school pupils' images of scientists (She, 1995). Then, Kahle (1993) has noticed that 'since the test does not require reading or writing skills, it minimizes the possibility of "socially desirable" responses.'

Students' image of science and scientists might be influenced by their science textbooks because of textbooks are used as the primary source of information in the science classroom (Denning &Yore, 1989). There are a few research studies that examined the relationships between students' image of science and scientists and science textbooks (She, 1995); Raizen and Jones (1985) reported that 90 percent of science teachers use textbooks 90 to 95 percent of instructional time, Rosser (1990) and others have pointed out that science textbooks contain a wealth of examples involving guns, cars, footballs, and machinery--all topics that typically interest boys than girls and Sjoberg (1993) suggested that textbook content is a contributing factor in shaping students' images.

# METHODS

The images of science and scientists held by Kocaeli Vocational School Students was analyzed by a modified Chambers' Draw-a-Scientist Test (DAST) procedure (1983). The test was applied to 120 students (65 male, 55 female) in 2016; these included 30 students from the programs that accounting, business management, chemistry and construction of Kocaeli Vocational School. Nine types of images were chosen as standard indicators: lab coat, eyeglasses, facial features (including beards, mustaches, or baldness), research symbols (scientific instruments and laboratory equipment such as test tubes, beakers, and scales), knowledge symbols (books, paper, or file cabinets), technology (i.e., computers or "black boxes" machines), relevant captions (such as formulae, Top Secret" or "Danger" signs, or taxonomic classifications, etc.), and natural objectives (animals, plants, etc.) (She, 1995). Individual drawing was analyzed and assigned scores from 1 to 8 to indicate the extent to which a standard image of a scientist was presented. Additional indicators such as scientist gender and working inside a lab were noted for further analysis. Reliability coefficient for two coders of the DAST of 0.86 (p < 0.01). Cross-coder reliability for the present study was measured at 88% agreement (She, 1995).

# FINDINGS

The mean indicators drawn by students in the programs that accounting, business management, chemistry and construction were, respectively, 2.61, 2.53, 2.84, and 2.91, respectively, showing that the number of indicators in student illustrations was the same for different programs(Table 1).

Programs	Number of Students	Number of Indicators	Mean Indicators Per
			Student
Accounting	30	170	2.83
Business	30	162	2.60
Chemistry	30	184	2.97
Construction	30	192	3.06

**Table** 1. Frequency of Drawn Indicators According to Grade Level

Results showed that two-thirds (89%) of Accounting program student subjects drew zero or one of the nine indicators, that 62% of Business program student and 52% of Chemistry program student subjects drew one but no more than two indicators, and that 11% of Business and Construction program student and 52% of Chemistry program student subjects drew three or more indicators. By Construction program students, 75% of student subjects drew at least two or three types of indicators, (Table 2). (N is number of students).

Indicator Scor	es	0	1	2	3	4	5	6
Accounting	Ν	2	4	6	7	7	3	1
	%	6.4	13.1	20	23.1	23.1	10	3,3
Business	Ν	1	3	6	8	8	2	0
	%	3,3	10	20	26.2	26.2	6.4	0
Chemistry	Ν	0	3	4	8	9	5	1
	%	0	10	13.1	26.2	33.3	3	3,3
Construction	N	0	2	5	5	9	7	2
	%	0	6.4	3	3	33.3	23.1	6.4

**Table 2**. Distribution of Indicator Scores by Programs

The most common indicator drawn by students regardless of grade were research symbols (i.e., test tube, beaker, alcoholic light, scale, and microscope); the majority of student's drawings depicted scientists at work inside a laboratory. Among four programs, five of the nine indicators drawn reached significant difference levels, including: lab coat ( $X^2 = 26.26$ ), facial features ( $X^2 = 71.41$ ), research symbols ( $X^2 = 24.65$ ), technology ( $X^2 = 27.40$ ), and relevant captions ( $X^2 = 34.42$ ) (Table 3).

Indicator	Accou	nting	Busi	ness	Chen	nistry	Consti	ruction		
	Yes	No	Yes	No	Yes	No	Yes	No	$\chi^2$	р
Lab coat	2	28							26.26	.0241
Eyeglasses	4	26	14	16	19	11	4	26	25.49	.0126
Facial Features	4	26	2	28	14	16	2	28	71.41	.0025
Research	10	20	18	12	2	28	10	20	24.65	.0136
Symbols										
Knowledge	3	27	14	16	4	26	14	16	61.25	.0089
Symbols										
Technology	2	28	10	20	18	12	4	26	27.40	.0171
Relevant	10	20	4	26	18	12	10	20	34.42	.0201
Captions										
Nature Objects	8	22	10	20	4	26	5	25	3.25	.0521
Inside of Lab	14	16	18	12	10	20	2	28	28.51	.0181

**Table** 3. The Number of Standard Indicators, Chi-square Statistics, and Probability Across the Four Grade (p < .05)

## RESULTS

The results of the present study show that the number of mean indicators drawn increased with different programs of the vocational high school, which supports similar findings reported by some of research mentioned in this study (Chambers, 1983; Schibeci and Sorensen, 1983; Schibeci, 1986) & Kahle, 1993). According to She (1995), 'the implications of such results are clear for both centralized and decentralized education systems having both types of textbook distribution systems: publishers must take care to promote gender-neutral, and positive images of science and scientists. While on the surface it may seem obvious that textbooks influence student images.'

For supporting to this finding, it is suggested that future studies include interviews with student subjects regarding the content of their drawings as well as the sources of their thinking. Finally, we can say that the textbooks have some degree of influence on students' image of science and scientists.



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# Tdic Insertion Analysis in the Pedagogical Practice of Teachers of Tthe Basic Education of the City of Apucarana-Pr-Brazil

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## ABSTRACT

The use of TDIC (Information and Communication Digital Technologies) in the school context has grown exponentially in recent times. The proximity of students with technological resources facilitates the insertion of tools that help the teacher in knowledge construction with the students and broadens their digital literacy. In this sense, the objectives of this study are: to present the profile of teachers from three state schools in the city of Apucarana -PR-Brazil; to know their opinion about what resources can be used in the classroom and to understand why teachers do not use the technological resources in the school context. The types of research used were bibliographical, field and analytical. The results showed that teachers need training for the use of new technologies as well as investment and availability of these tools in school.

Keyword: Technology; Teaching Practice; Continuous formation.

## INTRODUCTION

The use of new technologies in education has increasingly attracted the interest of researchers and professionals in the area of education. Technological tools arouse students' interest in learning, which sets up a strategy for learning content addressed in the disciplines. However, teachers' resistance to using new technologies in the school context will often prevent the student from being exposed to a school environment closer to their reality, which would facilitate their interest in classroom activities.

The technology applied to teaching and learning requires, according to Sarmiento (2010), the breakdown of cultural methods prior to the digital age, because technology brings about progress. However, there are questions that must be solved: Why the objection of part of the teachers in using new technological methods? Would it be the lack of knowledge and overwork that induces the teacher to refuse something new? Lack of physical or structural resources? Maybe lack of training? In this sense, in order to elucidate such questions, this study seeks to investigate the profile of teachers from three state schools in the city of Apucarana; know their opinion about which resources can be used in the classroom and understand the reasons why teachers do not use the technological resources in the school context

## THEORETICAL REFERENCE

Teachers' behavior fully reflects in the school culture. According to the National Educational Bases and Guidelines Law (1996), although all teaching staff participate in the elaboration of the Political Pedagogical Project - PPP, the teacher is the main element to certify that what was planned is fully applied. In addition, it has the autonomy to change, if necessary, the Teaching Plan according to the learning and the needs of the class. Therefore, the methods adopted by the teacher have a great influence on the facilitation of student learning.

Thurler (2001) argues that there is a necessity to transform schools into organizations more susceptible to changes, keeping them in a constant transformation and accession to technologies context. The difficulty of most teachers in adopting the use of new technologies in their lesson plans delays school evolution. Teachers must be the connection between the current information that is very fast and reaches all through TV, the Internet, magazines, scientific knowledge, among others. They cannot only depend on the blackboard (Perrenen 1999, Saviani 1985). According to Cambi (1999), education must go far beyond chalk, blackboard and saliva. Regardless of the student's level of study, dynamic and flexible classes can only improve learning.

Adopting the reflexive training method advocated by Perrenoud (1999) - where the teacher can be the bridge between knowledge and the student, acting as a mediator - is the ideal for the student to learn, assuming that the eagerness to learn is what leads man to learn (RANCIÈRI, 2002). Perrenoud (1999) and Barbosa (2011) still draw attention to a practice based on innovation and cooperation. For this to happen, it is necessary to know that the school is not an exiled island and if the society lives in constant change, the educational context must keep up with these changes.

Very quickly, students have access to information, whether through TV, magazines, the Internet, video games, among others, and these media act as first educators of young people (CAMBI, 1999). However, this information is fragmented. Thus, it is necessary that the teacher instructs them regards reality and technology so that there is a partnership between means and ends (PERRENOUD, 1999).

Moran (2009) affirms that the difficulties of some teachers in using new methodologies are to blame technological means for facilitating dispersion, especially the Internet, due to the possibility of navigation, once it could lead students to areas of personal interest, which according to the teachers would be a waste of time with insignificant information. To Perrenoud (1999) and Saviani (2000), teachers must be the link between technological means and scientific knowledge.

According to Moran (2009), the difficulties of some teachers regarding technology are evident and the reasons for them are mainly dispersion, focus loss due to the great offer of parallel subjects that are available on the sites all the time, involvement with personal interests and at last, the concept that the process of setting with technological means would be a waste of time. The author also states that teachers must be constantly improving themselves so that, instead of passing knowledge, it is built and created in students. According to him, knowledge is a process created in the relationship between student and teacher, it belies the idea that it is possible to transfer knowledge. Overcoming difficulties is essential for the teachers, obtaining the link with the methods, collaborating to consolidate and expand the innovative pedagogies. However, according to Barbosa (2011), a practice focused on cooperation is necessary and, according to Gebran (2009), this interaction between teaching and technological means is what brings about the instigating teaching to the student.

## MATERIALS AND METHODS

The types of research selected for the present study are bibliographical and field ones. The use of books, articles, periodicals, documents and official sites supported the bibliographic survey. To Gil (2008) this type of research obtains data from publications from other authors, which according to Marconi and Lakatos (1996) offers a basis for field research. After the bibliographic research, it is time for the field one, because the researcher has a base on the subject and can better distinguish the needs for the development of the material to be used in the research (MARCONI, LAKATOS, 1996).

Field research was adopted because it is a method in which data are observed and collected directly in the place where the study was done, characterized by direct contact with it, without any researcher's interference, since the data are observed and collected as they spontaneously occur (MARCONI, LAKATOS, 2006). Another reason for choosing this research style is the public's education degree, once all of them are teachers and thus they are graduated and have sufficient explanations to answer the objective questions allied to subjective ones.

As for the field study procedures, a questionnaire was developed with open and closed questions of multiple choice, because according to Gomes (2005) "a good questionnaire combines open and closed questions in a balanced way, takes the interviewee the shortest possible time to have it done and matches the research objectives ". In this document, the questions were proposed to answer the initial notes about the possible reasons that generate teachers' resistance to use new technologies in the school context.

The research public profile was random, named as accidental, where the researcher chooses the element that suits him better, for example: people who are present at the site at the time of data collection (MATTAR, 1996). This way, teachers from different disciplines from three state schools of the city of Apucarana-PR were interviewed. During the break, they were explained the purpose of the research and asked to answer the questionnaire. Ten questionnaires were distributed in each school, that is, 30 teachers participated in the research.



The deadline for answering the questionnaires was sufficient so that each teacher could answer them in a calm and concatenated way to avoid the distortions of a possible under peer pressure or even the supervision of the school board. At the end of the research, a total of 23 questionnaires were obtained. In general, the application of the questionnaire occurred quietly, however, many teachers did not answer the open questions, only the objective ones.

#### **RESULTS AND DISCUSSIONS**

In this section, the analysis of the data obtained with the result of the application of the questionnaire in the three public schools of the city of Apucarana-PR will be presented.

# **RECOGNITION OF THEACHERS' PROFILE**

The results obtained with the first question show that, out of 23 informants surveyed, 7 are men, it means 30%, and 16 are women, representing 70%. The disproportionality of teachers' gender equality in this category is approached through the analysis of the latest research published in 2016 by INEP - National Institute of Studies and Research Anísio Teixeira, which describes that in 2015 the profile of teachers was analyzed and separated by regions and states. In Paraná, which is the case of the research presented in this article, out of 135 thousand teachers, 115 thousand are women and only 20 thousand are men. An even greater disparity of gender is observed, since the number of women in the education system in Paraná corresponds to 85% in relation to the number of teachers while the 20 thousand male teachers reach only 15% of the total. The second question was related to the time the informants worked as professionals. The results in figure 1 show that 19 teachers, 82% have been working at schools for more than 10 years, demonstrating that most of them already has a consolidated career.



**Graph 1:** Time of experience as a teacher **Source**: Elaborated by the authors (2016)

## TECHNOLOGICAL RESOURSES

The third question dealt with the technological resources that can be used in classroom. Graph 2 shows the 10 most frequent options cited by informants. Among the answers given, the projector was the most cited element as a main tool to be used in the classroom, it was present in 87% of the answers, followed by the computer with 56%, the flash drive TV with 52%, the tablet with 43%, the Internet with 21%, the videos, the digital board and the cell phone are tied with 17% each and the radio with 13%. Out of 23 questioned people, 87% mentioned the projector as an essential tool to use in classroom, which corresponds to 20 people of the total.



Graph 2: Technological resources which can be used in classroom. Source: Elaborated by the authors (2016)

The fourth question sought to investigate which technological resources the informants used to prepare classes and materials. According to Leite (2004), technological resources are divided into two classes, the independent ones: that do not rely on electrical resources for their production or usage, and the dependent ones: which require electrical resources to be produced or used. In this regard, a list of independent and dependent resources was available, where they could indicate all those used by teachers in the preparation of their lessons.

In the result of this question the flash drive was obtained as main tool for the preparation of lessons, out of the 23 informants 21 opined in this matter which represents 91% of them, after that comes the computer with 20 votes, that is, 87% of the total, followed by the Internet with 19 responses corresponding to 82%. The blackboard and videos equaled 18 votes and 78%, afterwards the projector occupies 70% of the votes with its 16 voters and as the least cited come the tablet with 7 votes equaling 30%, the software mentioned by 2 teachers representing 8% and both the digital board and the book had only 1 mention equivalent to only 0.5% of the votes.

As shown in graph 3, it can be seen the two classifications of technological resources defined by Leite (2004) were mentioned, but the independent resources - which are those that do not depend on electric energy for their use - were presented by only 2 teachers, the book and the blackboard represent a low percentage, less than 1% of the total answers given. Few teachers considered them as a technological resource.



**Graph 3:** Technological resources used to prepare lessons and materials. **Source:** Elaborated by the authors (2016).



#### TRAINING FOR ICT USE

The fourth question is related to the training of teachers in relation to the use of technologies in the educational context, it questioned the participation in courses for the use of technological tools. If the answer were negative, there would be no need to answer the following question, but if the answer were affirmative, the next question questioned whether the courses were promoted by a public or private institution. Out of 23 informants questioned about participating in courses to use technological tools, 14 of them, that is, 60% answered that they participated in training to use the mentioned technologies. On this fact, Moran (2009) assures that teachers must be in constant improvement, that is, 40% of those investigated did not seek to improve their practice regarding the use of technologies in the educational context.

All 14 teachers who participated in continuing education answered that the course was offered by the school which they worked at. However, 9% of teachers, that is 2 teachers, also sought to improve themselves by taking private courses at the same time. Here it gets very clear when Cysneiros (1999) argues that even though schools have technologies to offer, it does not mean they are being used properly, because the technological resources are not used by teachers in a satisfactory way, since the training provided by schools to teachers are not sufficient to master the resources. As we could see, even with the training at their school, some informants felt the need to improve their performance by looking for more course options.

The issue number 7 sought to know why teachers do not use technological resources in classrooms. This questioning was carried out subjectively with some space for the teacher to comment, however, it was not what happened. Only 16 teachers, 70% of the total, of the 23 participants opined. From the options offered, lack of technologies mastery was the most cited topic, 8 out of 16 teachers who answered this question, that is 50% of those who answered this topic, believe that lack of technological tools mastery is the main factor that justifies the disuse of technological resources.

The insufficient class time for the use of technological resources was the second item in the ranking and 4 teachers out of 16 who answered, 25%, cited it as a decisive factor for the use of the tools. These numbers represent practically one-fifth of all teachers which is a high number of dissatisfaction with the amount of class hours or even hour-activity - period teachers have available to prepare lessons. In addition, this research happened in a scenario where the teachers of Paraná were entitled to 35% of their workload in hour-activity, which represents 7 classes for a standard 20 hours a week or 14 classes for a complete standard 40 hours a week. However, from 2017's school year on, these numbers for defining the hour-activity have changed. Through Resolution 113/2017 - GS / SEED, the Secretary of State for Education, on January 16 of this year, defined the working day for teachers of the State Basic Education Network of Paraná to be adjusted by the number of hours - activity. For 20-hour patterns, 15 of these are intended for time in classroom and only the other 5 are the hour-activity, which would be the time for the teacher to prepare their lessons, different from previous years where 13

hours were intended to time in classroom and 7 hours were at the teacher's disposal to prepare lessons. Yet, for the 40 hour-pattern it changes from 26 to 30 the number of classes in classroom and decreases from 14 to 10 the number of hour-activity class. A significant reduction of approximately 30% of the activity-hours, which directly interferes with the teacher's preparation time. If the teachers have any interest in using new technologies to deliver content, they may have to do it at home.

Thirdly, teachers chose the fact that technologies are actually working, 18% which is equivalent to 3 of the 16 teachers who opined about this matter, believe that the possibility of technologies malfunctioning is one of the reasons for being apprehensive about using them. Some of them, more precisely 12% that corresponds to 2 teachers, still claimed that there is no problem at all, they just do not use them. And to conclude this inquiry, 6 other options were tied in the votes, 6% each, which means that only 1 out of 16 teachers who were exposed and went on the unfavorable conditions of the classroom, better development of activities, insufficient equipment, laziness, delay in installation and resource availability.



Graph 4: What are the reasons why teachers do not use tecnological resources? Source: Elaboated by the authors (2016)

Regarding the suggestions teachers must increase the rate of use of technologies in classroom, 12 teachers, 52%, took notes. Graph 5 shows that the teacher training option was presented by 75% of the answers given, that is, out of 12 teachers who answered, 9 believe teacher training is fundamental to encouraging the use of technological resources. This information confirms once again the concept of Libane (1998) when he defends the need to integrate new technologies into the teachers' curricula and the development of skills to create favorable attitudes to the use of these technologies. Besides that, teachers asking for an ideal training shows that until now, as Gebran (2009) stated, teachers are still far from technologies and therefore the most mentioned option is teacher training.

The second option most pointed by the informants was the investment in equipment. Out of 12 informants 7, or approximately 60%, answered that there is a need for improvement in equipment investment which proves what Stahl (1997) stated when he cited the difficulties with investing in equipment procurement as one of the impediments to the use of technologies in education. Third, teachers cited the availability of equipment as a factor that disfavored the use of technology. To 4 out of 12 informants, that is approximately 33%, the lack of availability reduces the use of technologies. It is noticed that in this case the solution of the second most cited question - investment in equipment - would also solve the problem of the third item - unavailability of equipment - and it could make more teachers use technological means in their classes.

The maintenance of equipment was also cited by 2 teachers, 16%, asserting that the process of using technologies is a chain where several factors are interdependent. In the sequence, 8 options were cited with the same number of votes, only 1 vote out of 12 informants, which corresponds to 0.8% of the teachers who opined. Access to the Internet, change in curriculum, facilities for the teacher to acquire materials, improvements in classroom conditions, blogs, e-mails and incentive projects, classroom-based resources and longer time for preparation of classes were the 8 questions voted by only 1 teacher. Although there was only one vote for each of the matters above it is possible to realize that both are related, because how is there access to blogs to support the teacher didactics if there is no Internet access at school? Or how to set up classroom equipment if there is not enough time for class preparation? Therefore, it should be borne in mind that teachers have listed various adjustments to be made so that the use of technologies in class is more common to the teacher's daily life.



Graph 5: What is the suggestion for using Technologies in classroom? Source: Elaborated by the authors (2016)

# CONCLUSÃO

The results of the study showed that most the informants are women and the prevalence of teachers is experienced professionals, once more than 80% have more than 10 years of experience. Teachers consider as technological resources numerous tools that vary from a book to a video, but the projector remains prominent occupying the first place when it comes to technological resources. However, this was not the most pointed option when they were asked what resources they use in the classroom. The teachers rated the projector as the fourth piece of equipment used in class behind the flash drive TV, the computer and the Internet.

The data also showed the points that lead teachers to resist to the use of technological resources in the preparation of their lessons and presented options that may help them increase their use. The main reason which undermines the use of the technologies cited by the teachers is the lack of mastery of the tools.

As a suggestion of improvement in the increase of technological resources use, the predominant answers indicated the need for teacher training in relation to this knowledge, which comes to the foregoing question when they clearly pointed out the lack of control.

Despite being accomplished, the training has not sufficiently fulfilled the objective of building knowledge with the teacher, in addition, besides minimizing insipidity, it would also give the teachers a better procedural structure to organize their planning in a more dynamic way and even, after personal organization, reduce time of lesson plans. Which would make time to perfect their future lesson plans. Showing that there is synergy between the knowledge the teacher wants to pass and the technology the student wants to use and learn is a method that might help in understanding the contents.

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INFORMATICA	1	EDUC	CATIVA,	v		12	2,	n.	1,	199	9.	Dispo	nível	em:
< <u>http://www.puc</u>	rs.br/	famat/vi	iali/doutorad	o/pt	ic/tex	tos/	article	s-106213	arcl	nivo.pdf	> A	cesso em:	20 mar.	2017.



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# Teachers and Students' Perceptions of Teaching and Learning English in Small Classes: a Case of Ecuador

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## ABSTRACT

The English language teaching learning process in small classes may turn challenging for some teachers but also rewarding because of the results obtained. In our country, the majority of high schools have a big number of students in the English courses and this may be one of the causes for language low achievement. For this reason, this study is aimed at exploring teachers and students' perceptions on the benefits, strategies and resources, students' feelings, and the possible limitations the teaching and learning of English in small classes may yield to promote changes in the number of students in Ecuadorian English classrooms. The findings show that small classes help teachers design, apply activities, use strategies, and resources that make it easier for students to interact, participate, and receive appropriate feedback. Regarding students, they feel relaxed and motivated to learn English among few students; however, the fact that teachers' control of the small classes allows them to address students more frequently, make students feel anxious. **Keywords:** small classes, teachers and students' perceptions, benefits, strategies and resources, students ' feelings, limitations



#### **1. INTRODUCTION**

One of the most common obstacles that English teachers face in Ecuadorian high schools is the amount of students per class, which may have a positive or negative influence on the teaching and learning of the English language. The average number of students per class in public high schools is 40. In this sense, teachers make efforts to improve their teaching skills in order to overcome problems that appear in relation to the assigned class size. According to Harmer (2007) large classes present bigger challenges than small ones. But working with small groups may imply a necessity to overcome some specific challenges since as it is stated by Schreiner (as cited in Zayed 2016) working with small classes increases student anxiety. Despite the fact that the problem mainly lies on large classes, this study focuses on small classes. For this reason, the purpose of this paper is to identify teachers and students' perceptions of the benefits, strategies and resources, students' feelings, and the possible limitations in teaching and learning English in small classes. These results will be presented to our society as a contribution for the improvement of this field.

## 2. LITERATURE REVIEW

#### 2.1 Small classes

Deciding on the appropriate number of students in an English class has been discussed by field experts for some time. According to Finn, Pannozzo, and Achilles (2003) cited in Bray and Kehle (2011), when a class has less than 20 students, it is considered to be a small class. In fact, most EFL instructors prefer teaching groups of about 15 students which is similar to the above mentioned number. Folger (1989) cited in Bray and Kehle (2011) highlights that the benefits of small classes are reflected in students' learning behaviors; students' social behaviors; and student-teacher interactions. Regarding students' learning and social behaviors, students demonstrate more academic commitment which results in higher achievement. In addition, the author states that small classes provide opportunities for more active students' participation in regards of discussions and question-answer activities. In relation to student-teacher interactions, Folger (1989) reports that there are more opportunities for personalized instruction which helps to identify students' weaknesses.

Likewise, Exley and Dennick (2004, p. 3) state that "in a small group, students can be encouraged to talk, think, and share much more readily than in a large group. Communication is at the heart of small group teaching of any kind and a crucial first step is the willingness of the students to speak to the tutor and to each other." In addition, the authors claim that teachers benefit from small groups because they can provide feedback to all students; this support can be given during whole group or individual performance by providing advice on personal problems or in any issue that students may face.

#### 2.2 Managing learning in small classes

Success in the teaching-learning process involves different aspects; it goes from the design and implementation of good and flexible lesson plans to the application of accurate classroom management strategies.

The current literature review focuses on some of the aspects that are more relevant at the moment of teaching a lesson; aspects such as: instruction, feedback and timing. Regarding instructions, Harmer (2007) assures that there are two general rules that teachers have to consider when providing instructions because they must be as simple and clear as possible, and they must be logical. Nunan (1996) highlights that providing clear instructions is an ability that teachers have to develop to improve ESL, and EFL learners' performance.

Consequently, before an instruction is given, teachers have to consider students' previous knowledge, the message they want to convey, and the order in which the information must be used and presented; afterwards, the teacher must confirm students' understanding by requesting a student to explain the activity to be performed.

The time set for students to complete tasks is also an important aspect in managing learning. In this sense, Levin and Long (1981) have identified a subdivision. First, allocated time which is the space of time that teachers consider enough to develop the activity. Second, time on task which is the amount of time that students are engaged during the assigned task. Finally, academic learning time that is the moment in which learners develop the activity, and reach a high level of productivity.

Another aspect that is relevant to be included in managing learning is feedback; to this regard, Harmer (2011) states that in order to increase motivation, and enhance learning environment, it is important to provide feedback to students. In this sense, Ackerman and Gross (2010), affirm that both positive and negative feedback lead to successful performance. The authors highlight that the nature of feedback is negative since it focuses on the weak points of students' performance and motivates improvement. On the other hand, Ackerman and Gross point out that positive feedback emphasizes on positive aspects of an assignment which will increase students'



sense of achievement, but it is important to consider that pupils will not improve much if they only receive positive feedback.

#### 2.3 Learning environment in English classes

Dornyei and Murphey (2003, p. 77) have emphasized that being creative and flexible in the classroom build a relaxing learning environment; for instance, the arrangement of desks promotes interaction and communication which at the same time conveys powerful effects on students' participation, leadership opportunities and affective potential of group member. The authors highlight that it is not easy to suggest an ideal seating arrangement since it will depend on the purpose and needs.

In the same regard, Harmer (2001) states that the physical appearance of the classroom and the emotional atmosphere of lessons have positive results on students' motivation to learn. Thus, it is important to present an attractive classroom that generates an appropriate atmosphere where students can work on different activities without having problems when moving around the classroom if working individually or in groups. In the same fashion, Zubizarreta (2010) states that the environment in small classes allows collaboration, mentoring, active learning, and community building which are benefits used by teachers and learners to reach their goals.

#### 2.4 Strategies and resources to teach English

Regarding strategies, Robert, Kaplan, and Richard (1997) affirm that the use of the target language, group work and pair work are considered useful strategies that contribute to enhance communication in small classes. Another technique suggested by Wilbert and Marilla (2010) is discussion which can be used with any group size but it is more effective when used in smaller classes. By applying discussions, students are expected to integrate, apply, and think. These skills allow teachers to understand students' point of view.

#### 2.5 Teacher-student, and student-student interaction in small classes

According to Exley and Dennick (2004) teaching small groups allow instructors to boost students' interaction. By interacting, students share their opinions and help each other understand difficult concepts and explanations. In addition, Johnston (1990) (as cited in Bray and Kehle, 2011) states that small classes let students have frequent interaction with their teachers. As a result of the interaction among teachers and students in small classes, Zahorik (1999) (as cited in Bray and Kehle, 2011) explains that students get positive outcomes which increases enthusiasm and self-confidence.

#### **2.6 Previous Studies**

Previous studies have been devoted to discover whether or not small classes benefit English language teaching and learning. Blatchford, Russell, Bassett, Brown, and Martin (2006) conducted a longitudinal research design study aimed at determining the effects of class size on teaching in English primary schools of pupils aged 8-11 years. The sample for this study involved 202 schools, chosen by stratified random sampling. The data was gathered by using a multi-method approach, integrating qualitative information from teachers' end-of-year accounts and data from case studies with quantitative information from systematic observations. The authors concluded that there was more individual attention in smaller classes, a more active role for pupils, and beneficial effects on the quality of teaching.

A similar study conducted by Din (1999) focuses on the functions and benefits of small classes to both teachers and students. For the purpose of this study, full-time teachers with five or more years of experience in a school district were selected. A questionnaire that contained open-ended questions related to Chinese rural teachers' perceptions regarding class size was applied to each of the selected teachers. The results permitted to reach to the conclusion that Chinese rural teachers think that there is not a relation between class size and student achievement. Nevertheless, they consider that small classes promote classroom management, interaction between teacher and students, and personalized feedback from teachers; and reduce teachers' working time.

Harfit (2012) conducted a small-scale exploratory study that aimed at examining whether and how class size reduction might help to alleviate language learning anxiety, which has long been seen as an obstacle to second language acquisition. To develop the study, the author applied multiple case studies in 4 Hong Kong secondary schools. Each case study involved one teacher teaching English language to first language Chinese students in a reduced-size class and a large class of the same year grade, and of similar academic ability. Multiple interviews were applied to four teachers and 231 students. Students' interview focused on their perspectives and experiences of studying in large and reduced-size classes. The research findings revealed that students' sense of anxiety can be reduced in smaller classes.

Galton and Pell (2012) conducted a study with the purpose of establishing the benefits of teaching in a small class. In addition, the study sought to find if there was improvement in the student's' participation and quality of



teaching in a reduced class. For this research, 37 primary schools participated voluntarily. In order to gather the information, the sample was divided in 3 cohorts that were observed and recorded in a 3 year period. During the first 2 years, reduced classes were chosen to be observed. In the last year of the study, both normal and reduced classes were observed. In addition to the observation, researchers recorded the student-student and student-teacher interaction. The authors concluded that students in small classes do not get more of the teachers' complete attention, than students in regular classes. Also, teacher-student interaction in normal classes is really brief compared to interaction in small classes where interaction is longer.

## 3. METHOD

#### **Participants**

This study was conducted in Ecuador. The sample consisted of 1146 students and 84 teachers from three regions of the country, Coast, Highlands, and Amazon. The participants belonged to different schools, high schools, and language academies where English is taught as a foreign language. The sample included learners from diverse socio-economic status.

#### Procedures

A mixed method research design was selected to conduct this study. In order to collect the data, 2 instruments were designed, a questionnaire for teachers and students; and an observation sheet. The questionnaires were designed in English and were aimed at gathering teachers and students' opinions regarding the teaching and learning of English in small classes in Ecuador.

The observation sheet included questions to support what teachers and students answered in the questionnaires. These questionnaires and the observation sheet were validated by experienced teachers. Secondary researchers of around the country were trained in order to apply these instruments.

#### 4. ANALYSIS

	Table1: Teachers and students' perceptions of teaching English in small classes in Ecuador									
		Теа	chers'	percept	ions	Students' perceptions				
Description			Disagree	Agree	Totally agree	Totally disagree	Disagree	Agree	Totally agree	
		%	%	%	%	%	%	%	%	
small	1. The designed activities help to apply what they have been	students n taught. 2.44	2.44	31.71	63.41	0.88	5.1	39.93	54.09	
glish in	2. The students are attentive an participate in class activities.	d 2.44	3.66	32.93	60.98	1.32	12.05	50.75	35.88	
ning En	<ol> <li>Classroom space allows stud properly do the activities des</li> </ol>	ents to igned. 3.66	6.1	30.49	59.76	1.58	7.3	37.03	54.09	
and lear classes	4. Appropriate feedback can be	given. 2.44	3.66	31.71	62.2	1.85	8.88	35.88	53.39	
aching a	5. Activities that allow more in among students are performe	teraction 2.44	6.1	26.83	64.63	2.64	8.27	40.55	48.55	
fits of te	6. There is more interaction bet teacher and the students.	ween the 2.44	1.22	30.49	65.85	1.32	5.54	30.87	62.27	
Bene	7. It is easier to remember stude names.	ents' 2.44	2.44	24.39	70.73	1.23	7.39	23.48	67.9	
r th	8. Design and apply activities tha student to practice listening, sp	t allow 0.31 beaking,	4.27	29.56	65.85	1.3	7.72	33.07	55.43	



	reading, writing skills.								
	9. Design and apply group work activities.	0	3.65	34.14	62.19	1.85	11.96	37.82	48.37
	10. Design and apply individual activities.	1.22	3.66	21.95	73.17	1.5	6.07	32.1	60.33
	11. Use technological tools	3.66	12.2	30.49	53.66	11.26	2.9	32.54	34.3
	12. Use didactic materials.			30.49	58.54	5.36	18.56	37.03	39.05
ning	13. They are relaxed when speaking in front of their classmates.	1.22	6.1	43.9	48.78	2.9	10.47	36.94	49.69
when learn all classes.	14. They feel part of the class because the teacher gives them more opportunities to participate.	1.22	1.22	20.73	76.83	2.11	9.94	37.82	50.13
ts' feelings glish in sm	15. They are motivated to participate because of the small number of students.	1.22	7.32	28.05	63.41	1.5	10.2	38.87	49.43
Studen En	16. They are at ease because they can healthy compete with their classmates.	0	4.88	30.49	64.63	2.02	9.41	37.82	50.75
Limitations of learning English in small classes.	17. There is anxiety among students because there is more control form the part of the teacher.	12.2	26.83	46.34	14.63	11.52	21.11	37.38	29.99

Findings in table 1 reveal that an important number of teachers 63.41% and 31.71% totally agree and agree in relation to item 1. In the same way, 54.09% of students totally agree and a 39.93% of them agree on the fact that the activities applied in classes help students to practice what they have been taught. These results indicate that the small number of students in the class allows teachers to design activities that enhance students to move from theory to practice, thus reinforcing their knowledge; resulting in the achievement of English language goals. On the contrary, 2.44% of teachers totally disagree and disagree respectively and a small percentage of students 0.88% totally disagree and 5.1% disagree. These results indicate that a small amount of students believe that they do not benefit from the activities their teachers apply during the lessons because of the level of difficulty of the types of activities used do not allow learners to improve their knowledge of the English language.

The positive results obtained in item 1 were also confirmed through classroom observations where most of the activities used were well designed considering the contents studied during the lessons and the different learning preferences; that is the reason why students seem to be motivated and feel confident to participate. These findings are supported by Folger (1989) cited in Bray and Kehle (2011) who argue that students in small classes participate in activities such as discussions and question-answer providing them opportunities for applying what they have learned. Similarly, Exley and Dennick (2004) claim that students may be engaged in activities that allow them to talk, think and share. Through this strategy they can demonstrate their competence in the English language.



In regard to item number 2, the results presented in table 1 show that 60.98% and 32.93% of teachers totally agree and agree respectively. Similarly, students' responses show that 50.75% and 35.88% of them agree and totally agree on the fact that in small classes, students respond attentively and with enthusiasm to the planned activities, they are keen to participate with more confidence with their peers. In contrast to these positive results, table 1 also shows that a small percentage of teachers 3.66% and 2.44% disagree and totally disagree, in that order; in the same perspective 12.05%, and 1.32%, disagree and totally disagree respectively to the aspects mentioned above. In addition to the results above, the class observation evidenced that classrooms with a small number of students allow teachers to manage the class better and also facilitate students to actively participate in class, and be attentive most of the time during the lesson. In regard to students' responsiveness and willingness to participate in small classes, Exley and Denneck (2004) emphasize that in small classes, teachers can easily motivate students to think and share among them and participate in class. Regarding motivation, Zahorik (1999) (as cited in Bray and Kehle, 2011) emphasizes that when students get positive outcomes, their enthusiasm and self-confidence boosts. Besides, the authors emphasize that communication is inherent to small classrooms. Based on the aforementioned information, teaching in small classes not only promotes students motivation but also enhances enthusiasm and self-confidence; therefore, it is more productive to work with small classes.

As it can be seen, 59.76% and 30.49% of the teachers agree and totally agree respectively on the statement presented in item 3; likewise, a high percentage of students (54.09% totally agree and 37.03% agree) perceived that in classrooms with a low number of students, the space can be used effectively for different activities. There is enough room to arrange seats in different ways which at the same time suits the performance of a variety of activities. On the other hand, a low percentage of teachers (3, 66 % totally disagree and 6, 1% disagree) and a low percentage of students (1.58% totally disagree and 7.3% disagree) think that classroom space does not influence in the performance of activities in small classes. In addition to the above results, through the observations, it was evidenced that students were eager to collaborate when teachers asked to arrange seats according to the activities. These results are supported by Dornyei and Murphey (2003, p. 77) who highlight that the arrangement of desks promotes interaction and communication which enhances students' participation, leadership opportunities and group work.

As it is observed, 62.2% of teachers totally agree and 31.71% of them agree with the issue stated in item 4. Comparably, 53.39% of students totally agree and 35.88% of them agree on the fact that in classes with a small number of students it is possible to provide effective and timely feedback as part of the learning process. As a result, students benefit from small classes since teachers have enough time to address personal students' mistakes by giving them immediate feedback favoring meaningful learning. These results are aligned with Harmer's ideas (2011) who states that in order to promote motivation, and to enhance learning environment, it is important to provide feedback to students. On the other hand, a small percentage of teachers, 3.66% disagree and 2.44% totally disagree, and a similar small percentage of students, 8.88% disagree and 1.85% totally disagree on the fact that appropriate feedback is given. In addition to the above mentioned results, the observation corroborated that teachers give appropriate feedback in classes with a reduced number of students by solving each student concerns. In this sense, Ackerman and Gross (2010), affirm that both positive and negative feedback lead to successful performance. The authors highlight that the nature of feedback is negative since it focuses on the weak points of students' performance and motivates improvement. On the other hand, these authors point out that positive feedback emphasizes on positive aspects of an assignment which will increase students' sense of achievement, but it is important to consider that pupils will not improve much if they only receive positive feedback.

The results show that in item five 64.63% of teachers totally agree, and 26.83% of the teachers agree on the fact that carrying out activities in small classes allow more interaction amongst students. Moreover, the results also show that 48.55% of students totally agree and 40.55% of students agree on the same fact. In this regard Exley and Dennick (2004) state that interaction increases in small classes because students are able to share their thoughts and help each other when facing difficulties. At the same time, results in item 5 show that 2.44% of the teachers totally disagree and 6.1% disagree on this same item. Furthermore, 2.64% of students totally disagree and 8.27% disagree on the fact that activities in small classes permit interaction among students. These results concur with the class observation where the majority of students had the opportunity to share ideas and participate in discussions; while just a few number of students did not participate at all when working in groups. Indeed, they did not use the target language at all.

Regarding item 6, there is more interaction between teachers and students when working in small classes, the statistical analysis provided the following results; 65.85% and 30.49% of participant teachers totally agree and agree, correspondingly. In the same line, 62.27% and 30.87% of participant students totally agree and agree, in that order. Conversely to positive results, table one shows that a small percentage of teachers and students do not



agree on the fact stated in item 6. In this sense, 2.44% and 1.22% of teachers totally disagree and disagree, respectively; likewise, 5.54% and 1.32% of students disagree and totally disagree, correspondingly.

It is important to highlight that the statistical results presented above are closely related to the anecdotic data gathered during the class observation, in which it was evident that interaction between teachers and students was more frequent and productive in the sense that teachers were able to personalize the information.

Not only statistical results and observation data confirm the increase of interaction between teachers and students in small classes, but also authorities in the field highlight the fact that students interact more frequently with their teachers in small classes (Johnston, 1990 in Bray & Kehle, 2011). The improvement of interaction in small classes takes place among students, and also between teachers and students. In the first case, the interaction is a means to share information and support learning while in the case of student teacher interaction, the teacher use it to encourage students participation, as Exley and Dennick (2004) concluded. From all of the evidence, it is clearly inferred that small classrooms become an appropriate environment for interaction to take place.

As shown in item seven, 70.73% and 24.39% of teachers totally agree and agree respectively. A similar percentage of students, 67.90% and 23.48% totally agree and agree. These results suggest that a big amount of teachers and students consider that learning students' names in small classes is not a problem because a small group of students make the task of learning students' names easier. On the contrary, a small percentage of teachers (2.44% totally disagree and disagree respectively) while 7.39% and 1.23% of students totally disagree and disagree. From the observations conducted, it was encountered that in most of the lessons, teachers call students by their names. It was also evident that calling students by their names is a good strategy that provides some benefits in the classroom; for example, the students who participated in this study feel more comfortable and confident during the development of each activity.

The statistical data obtained from teachers in item 8 show that 65.85% and 29.56% totally agree and agree respectively; this is confirmed with students' data, 55.43% and 33.07% totally agree and agree on the fact that in small classes, teachers can design and apply activities that allow students to strengthen the listening, speaking, reading, and writing skills. On the other hand, a low percentage of teachers, that is 4.27% totally disagree and 0.31% disagree and a similar tendency among students that represents 7.72% who totally disagree and 1.3% who disagree correspondingly. In addition to the above results, the class observation evidenced that classrooms with a small number of students offer an appropriate environment to develop the four skills but mainly the speaking skill because all students have the same opportunities to participate in the activities which is challenging when teaching large classes. To this respect, Ur (1996) states that speaking is the most important skill among the four language skills because people who know a language are referred to as speakers of that language. Thus, students in small classes are exposed to a vast amount of practice that help them to achieve the communicative competence.

With regard to item 9, findings show that 62.19% and 34.14% of teachers totally agree and agree respectively. Regarding students responses, 48.37% and 37.82% of them totally agree and agree correspondingly. These results signify that a large percentage of teachers and students consider that group work activities are easy to develop in small classes. On the other hand, a small percentage of teachers 3.65% disagree and 1.85% and 11.96% of students totally disagree and disagree on the fact that group work activities are applied in small classes. In addition to these results, the observations conducted in the sample classrooms confirm that most of the activities applied during the lesson are developed in groups where students can have more opportunities for verbal interaction, they help each member of the group to accomplish the assigned tasks and enjoy participating in every group work activity. In this respect, Robert, Kaplan, and Richard (1997) claim that group work is an excellent strategy that benefit teachers and students in small classes in the sense that communication is enhanced.

Results in item ten show that 73.17% of teachers totally agree and 21.95% agree that designing and applying individual activities favor the English teaching is small classes. In addition, 60.33% of students totally agree and 32.1% agree on the same fact. Contrary to the previous results 1.22% of teachers totally disagree and 3.66 disagree on the fact that designing and applying individual activities favor the English teaching in small classes. A similar tendency was obtained from the students in which 1.5% of them totally disagree and 6.07% disagree. Contrasting the results with the observations, it can be affirmed that making students work on individual activities allows them to give more thought, participate and express their ideas; thus, favoring English learning.

Results in table 1, item 11 demonstrate that 53.66% and 30.49% of teachers totally agree and agree respectively with the fact that small classes allow the use of technological tools. Similarly, 34.3% (totally agree) and 32.54% (agree) of students agree with this fact. On the other hand, 3.66% and 12.2% of teachers (totally disagree and



In regard to the use of didactic material, the results obtained in item 12 are the following: 58.54% and 30.49% of teachers totally agree and agree respectively on the fact that it is easier to use a variety of didactic materials in a small class; this fact is corroborated by 39.05% of students who totally agree and 37.03% of students who agree. In contrast to these positive results, 10.98% of teachers totally disagree as well as 5.36% and 18.56% of students (totally disagree and disagree) consider that small classes do not favor the teaching and learning of English by using didactic materials. The observations confirmed the results provided by the majority of teachers and students since didactic materials such as flashcards, pictures, dictionaries, photocopies, posters, maps, and books were used to teach different contents.

Considering that speaking skill is one of the most difficult skills to be developed; in the current analysis, item 13 aims to prove if the statement 'In small classes, students are relaxed when speaking in front of their classmates,' is right or wrong. Taking as the base the information gathered from the statistical report, it is seen that 48.78%, and 43.9% of teachers totally agree and agree, respectively; in the same regard, 49.69% and 36.94% of students totally agree and agree with the fact that 'In small classes, students are relaxed when speaking in front of their classmates'. On the other hand, 6.1% and 1.22% of teachers disagree and totally disagree to the fact that 'In small classes, students are relaxed when speaking in front of their classmates;' in the same line, 10.47% and 2.9% of students disagree and totally disagree on the statement being analyzed. In regard to the influence of class size on the development of the speaking skill, it is stated that a small class is the perfect place for learners to develop willingness to improve their speaking skills (Yashima, 2002). The results of the current analysis plus the fact presented by the expert on the field have contributed to confirm that 'in small classes, students are relaxed when speaking in front of their classmates.'

In the case of item 14, the trend is that the majority of the teachers, that is 76.83% of them, totally agree and 20.73% who agree on the fact that small classes favor students' language learning because they can be provided with more opportunities to participate in class. These opinions are corroborated by students' perceptions since 50.13% of them totally agree and 37.82% agree that in small classes there is more likelihood of student active participation in the learning process which fosters a high level of energy and enthusiasm in the classroom learning environment. It is evident that in small classes it is feasible to ask each student to participate. The percentage of teachers who totally disagree and disagree on the statement posted in item 14 is only 1.22%; the same happens with the students who totally disagree since it reaches only 9.94% and the ones who disagree is only 2.11% who consider that in small classes they do not feel part of the class because teachers do not provide them equal opportunities to participate. The class observations corroborated what was mentioned by the majority of students because it was evident that students feel part of the class because the teacher is constantly calling on their names for interactive participation. According to Harfitt (2015) it is clearly noticeable that small classes seem to be characterized by more collective identity through increased participation.

Motivation is a crucial aspect in the teaching learning process of the English language; motivation can be intrinsic or extrinsic, and it can be triggered by many different factors: affective, physical, among others. In the analysis of item 15 from the current study, the influence of a physical aspect in the motivation to learn English is observed: 'Students are motivated to participate because of the small number of students.'

In regard to the fact stated in item fifteen, an amount of 63.41% and 28.05% of teachers express that they totally agree and agree, in that order, on the fact that students are motivated to participate because of the small class size. The same positive results are seen on the student's side 49.43% and 38.87% of students responded that they totally agree and agree respectively on the fact that students feel motivated to participate because of the small number of students. Conversely to positive results, it is seen that 7.32% and 1.22% of teachers disagree and totally disagree on the fact that students are motivated to participate because of students. In the same sense, 10.2% and 1.5% of students disagree and totally disagree, to the statement being analyzed, accordingly. In regard to small classes as an aspect that motivates students' participation, Exley and Dennick (2004, p. 3) state that in small groups, "students can be *encouraged* to talk, think, and share much more readily than in a large group." The authors also state that "Communication is at the heart of small group teaching of any kind and a crucial first step is the *willingness* of the students to speak to the tutor and to each other."

All in all, it can be assured, based on the information above, that there is a direct relation between motivation and number of students in class which means the smaller the number of the students, the higher the degree of motivation, and vice versa.

With respect to item 16, 30.49% and 64.63% of teachers totally agree and agree and 37.82% and 50.75% of students totally agree and agree respectively on the fact that small classes provide an adequate environment in which students can healthy compete. On the other hand, 4.88% of teachers disagree and a small percentage of students 2.02% and 9.41% totally disagree and disagree respectively. The positive results obtained in this item were verified with the observations performed in the classrooms where teachers apply activities in which students can healthy compete. While the activities were performed, it was perceived that students work collaboratively and the different groups compete in a healthy environment. As it is stated by Zubizarreta (2010), the environment in small classes allows collaboration, mentoring, active learning, and community building which help teachers and students to accomplish their goals.

Nevertheless, working with a small number of students can also generate students' anxiety as it is demonstrated in the results obtained in item 17 which show that 14.63% of teachers totally agree on the fact that in small classes students are more controlled, which may them feel anxious when working in the classroom, and 46.83% of them affirmed that they agree. Comparing these results with students' perceptions, it was found that 29.99% totally agree and 37.38% agree; on the contrary, 12.2 and 26.86 of teachers totally disagree and disagree while 11.52% and 21.11% of students totally disagree and disagree that there is anxiety among students because there is more control from the teachers' side. During the class observations, it was confirmed that some students do not feel comfortable in small classrooms due to the fact that the teacher monitors them all the time. It is aligned with Schreiner (as cited in Zayed 2016) point of view who states that working with small classes increases the level of anxiety in students.

#### CONCLUSIONS

Teaching English in small classes provide more benefits than limitations. Teachers have the opportunity to apply varied resources, strategies, and activities that involve working in groups or individually. They allow students to put into practice what they have been taught in a more interactive manner without worrying about space limitation. Another benefit is that students feel more confident to interact among them because of the sense of empathy and respect that builds up in small classes; additionally, communication between students and teachers becomes at ease because teachers are capable to personalize feedback which helps to increase students' sense of belonging. On the other hand, it was found that small classes increase students' anxiety when they feel that teachers control or monitor them all the time which inhibits them at times. This represents a limitation to be considered for further studies.

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# Teachers' Attitudes Investigated Towards Students with Autism Spectrum Disorder

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## ABSTRACT

This study was undertaken to determine the attitudes of primary public regular school teachers towards the inclusion of students with Autism Spectrum Disorder (ASD) in Malaysia. The purpose of this research is to measure the teachers' awareness of, and attitudes towards students with Autism Spectrum Disorder (ASD) inclusive education in the mainstream schools. This study is conducted with 100 participants from 3 primary schools Kuala Lumpur, Selangor in Malaysia, who completed a survey that covered socio-demographic information and teaching experience, attitudes of inclusion within their school, experience and knowledge of ASDs, influences on inclusion of pupils with ASDs, ability to cope with behaviors associated with ASDs, and benefits and problems associated with inclusion of pupils with ASD in mainstream



Analysis was quantitative, the independent variables were gender, age, and experience of teaching children with Special Educational Needs (SEN); the dependent variables were knowledge of Autism and attitude towards children with ASD. Very few differences in knowledge or attitude were found among the different groups of teacher educational background. The findings were no significant differences in either knowledge or attitude were found in age or gender. The study shows, that whilst teachers with experience of teaching children with SEN had more knowledge, they also did not have more positive attitudes as compared to others from different majors. In general, the study revealed that most teachers had a moderate level of knowledge on SEN. The concern of inclusive education for teachers, teacher educators and children with ASD alike that there may possibly be no interrelatedness between knowledge, attitudes, and experience.

Keywords: Autism Spectrum Disorder, teachers' attitudes, inclusive education, inclusion, teachers' training

## INTRODUCTION

Teacher attitude is a moderating variable that can influence the successful implementation of effective interventions within the inclusive classroom. Autism is a complex developmental disability that typically appears during the first **3** years of life due to a neurological disorder that affects the functioning of the brain. It is **4** more **times** prevalent in boys than girls. Autism shows no racial, ethnic or social boundaries, and cuts across family income, lifestyle and educational levels. Autism and its associated behaviors have been estimated to occur in as many as **1 in 68** newborns (CDC, 2014). That would mean approximate 9000 children in Malaysia are born with Autism every year. Ministry of Health Malaysia, the prevalence of ASD in Malaysia was approximately 1.6 in 1000 (MaHTAS, 2014). As the number of school-age children diagnosed with ASD increases drastically, the inclusion of these children in the regular education classroom have become a major educational concern.

Research has demonstrated many benefits of inclusion for students with ASD, especially positive social interactions and peer modeling (von der Embse, Brown, & Fortain, 2011). However, including students with ASD in the regular classroom can be challenging because ASD is characterized by symptoms in two domains: social communication for instance problems adapting behavior to fit various social contexts, poor eye contact, and abnormal facial expression and behaviors and interests such as unusual interests and stereotyped body movements (American Psychiatric Association, 2013; Hall, 2012). Behaviors in both domains play an important role in impacting the daily functioning of students with ASD, especially in their interactions with peers, teachers, and other personnel within a school setting.

Therefore, the purpose of this study was twofold: (a) to investigate in-service teachers' attitudes towards students with ASD; and (b) to examine the implications of the attitudes on professional practice. The following literature review defines teacher attitudes and discusses existing studies on teacher attitudes related to students with ASD. The rationale and research questions for this study are then presented. This study investigated on the specific inclusion of students with ASD in the general education classroom by addressing the needs of the teachers.

#### Autism Spectrum Disorder Definition

*Autistic Disorder*. Autistic Disorder, also known as classic autism, is characterized by impairments in "social interaction, communication, and behavior with restricted and stereotyped interests" (Tonge & Brereton, 2001, p. 672). Autistic Disorder can be clearly diagnosed by "30-36 months," yet symptoms are more commonly noticed "during the second year of life" (Tonge & Brereton, 2011, p. 672). The cognitive ability of children with Autistic Disorder can range from severe to moderate disabilities. However, usually a cognitive assessment "reveals a scatter of abilities with more difficulty in verbal and language skills" and this is coupled with a "better performance in visual motor activities" (Tonge & Brereton, 2011, p. 673). Children with Autistic Disorder also fail to make eye contact and lack facial expression while they also "tend to follow their impulses regardless of the situation" (Vernon & Rhodes, 2009, p. 6). Roughly one third of children with Autistic Disorder are nonverbal. The majority of children with Autism Disorder has IQ scores described labeling them with an "intellectual disability;" however, one third have an IQ score of average or above average (Ryan et al., 2011, p. 57).

Classes of Autism Spectrum disorders consist of "Autistic disorder, Asperger's disorder, and Pervasive Developmental problems - no longer in any other case specified (PDD-NOS) (Gerdts & Bernier, 2011, p. 1). Every of these disorders has their personal set of characteristics, but they have a tendency to overlap and are grouped into the ASD identify. Autistic disorder is characterized by means of social, communication, and behavior restrictions. Asperger's disorder is a form of autism wherein youngsters show the characteristics of Autistic sickness, but lack the cognitive and speech delays. Children categorized with PDD-NOS have Autistic characteristics, however they do now not match underneath a particular labeling or disorder. Rett Syndrome and early life Disintegrative disease (CDD) can also be labeled beneath the ASD umbrella (Ryan et al., 2011).

ASDs are characterized by means of students "being impaired in the ability to communicate, recognize the language, play, broaden social skills, and relate to others" (Raymond, 2008, p. 197). In 1943, Kanner first created a set of 7 functions of individuals with autism. These seven functions had been: (a) incapacity to relate themselves to human beings and situations, (b) poor language improvement, (c) echolalia, (d) awesome rote memory, (e) perseveration and repetitive behavior, (f) anxiously obsessive with sameness, (g) suitable cognitive potentialities and typically normal appearance (Vernon & Rhodes, 2009, p. 6). In diagnosing autism, children ought to portray capabilities in 3 distinct areas consisting of impairment of communication or social capabilities, stereotypical behaviors like rocking and finger actions, and sooner or later, there has to be a delay in ability improvement earlier than age three. Social interactions are tormented by autism and characterized by means of minimal to no eye contact and unawareness to social occasions. Conversation usual, was minimized and blanketed repetition with nearly robot speech. Kids with ASD are also characterized by means of set exercises and gross and best motor abilities being very repetitive. Cognitively, kids with ASD might also have intellectual retardation or have characteristics of a savant that children with ASD are also very impulsive and absence manipulates "no matter the scenario" (Vernon & Rhodes, 2009, p. 8) Youngsters with ASD are being diagnosed at an increasing rate categorized with ASD, unique education, legal guidelines were pressured to include this diagnosis of their guidelines.

*Importance of Teacher Attitudes in the Classroom*; to increase the feasibility of including students with ASD within the regular education classroom, it is important to determine effective interventions that help mitigate the negative impact of the disorder. In addition, examining moderating variables is also crucial because they may influence the implementation of the interventions, thus impacting their effectiveness. Teacher attitudes toward disability and inclusive education have received a growing volume of attention in recent years, with a focus on increasing the educational outcomes and positive school experiences of students with disabilities (Vaz et al., 2015).

In Malaysia, the awareness of autism has increased in the last few years as evidenced by the number of cases reported and parents seeking medical attention. However, there is no compilation of local research on ASD. This would make it difficult to objectively assess the situation and to develop support systems and services for children with ASD and their families. The current state of research on ASD in Malaysia and identify gaps in scientific knowledge (TechnicalReportAutismSpectrumDisorderResearchInMalaysia, 2015). Said et al. (2013) found that teachers had a moderate level of knowledge in special education needs. In investigating knowledge and confidence of teachers, the study found formal teachers' training was not effective with regards to understanding and teaching children with ASD. Quality of training in the service was only moderate but it was better than formal training. This resulted in teachers having low confidence in teaching children with ASD (Hasnah et al. 2010)

The usual teaching approach used was to reach out and attract attention of the students to help them focus. The study on teachers' perceptions (Nornadia et al. 2013) showed that the teachers were not prepared to teach children with ASD in their class.

*Definition of Teacher Attitude;* According to Triandis (1971), attitudes is defined as a person's cognitive and emotional evaluations and behavioral intentions toward an object or information.



The object of an attitude can be individuals, organizations, values, and so forth. The cognitive component refers to the individual's beliefs as well as information and knowledge about a person, an object, or idea. The affective component represents the individual's emotional reactions to the object or person for instance, exposure to students with ASD, and the behavioral component deals with how the individual acts or intends to act toward the person or object. In theory, a person's attitude affects cognitive, emotional, and behavioral reactions toward others, and therefore a teacher's attitude toward a student with ASD can have a tremendous impact on their interactions in the classroom. Besides, teachers' attitudes have a significant impact on learning in an inclusive classroom.

On the other hand, the importance of teachers' attitude, researchers have endeavored to decide some of the underlying elements to give an explanation for what contributes to their mindset, with lots of this inquiry focusing on primary and secondary teachers in Western international locations (e.g., Hsieh & Hsieh, 2012). A number of the underlying elements include teacher training, the types of special needs encountered, teachers' knowledge of special needs, teachers' enjoy of youngsters with special needs, and the expert role held. Last decades, numerous papers were written for ASD, teacher education, teacher perceptions; but the lack of studies dedicated to educating general education teachers in nicely educating youngsters with ASD is plain. In this case, to meet the needs of an increasing population of youngsters with ASD, research which includes this one have to be conducted to gain academic literature and practice.

#### LITERATURE REVIEW

Research by Koegel et al. (2011) had proven that children with disabilities displayed better social skills and academic achievement when they learnt in the same environment with their typically developing peers. Inclusive education is very important as it provides access to quality education for children with disabilities. Segregation in education causes fear, discrimination and prejudice towards people with disability. All children need an education that will support them in building friendship and prepare them for future life. On top of this, inclusive education assists children with disabilities in reducing the anxiety in building friendship and attaining respect from others around them. According to the advocates of ASD students' integration, full inclusion of these students raises teachers' expectations for these students. In conjunction with behavioral mimicking of their 'normal' peers, the result is seen to be more learning by ASD students.

It raises ASD students' self-esteem, leads to an understanding and accepting attitude by peer students and, subsequently, to less isolation and stigma for ASD students. A number of studies demonstrate that the autistic behavior of preschool children is significantly reduced when ASD students mix with 'normal' peers Integration of ASD students is also beneficial for normally developing students who learn to accept variant behaviors and attitudes.

In a latest study casino et al. (2013) is usually recommended that full-size enhancements may be made in peer social connections for ASD students in general education classrooms with a quick intervention, and that these benefits persist through the years. However, a few in advance research argue that mainstream teachers view themselves as incapable of managing ASD students. But, guide that mainstream schools can significantly help ASD students to widen their social knowledge and postulate that teachers display a critical role in ASD integration applications. Furthermore, two essential factors are concluded as conditions for the a successful implementation of these programs; this is, 'the willingness of teachers to participate' and 'the best schooling of teachers' [26]. In a recent observe inside the area of educating ASD students, taking Greece as a case study the present paper intends to enhance the earlier research and increase at the preceding empirical findings, contributing in addition beneficial perception into ASD students' integration.



A current survey carried out through the Hong Kong equal opportunities commission (2012) discovered that fifty% of the principals and teachers disagreed to simply accept youngsters with intense disabilities; and 20% of the principals and 50% of the teachers and experts discovered they knew little about the improvement of inclusive education and associated supports and resources available. In case, maximum considerably, regular class teachers felt underprepared and untrained for inclusion (equal opportunities commission, 2012). Despite the fact that, unknown is whether comparable attitudes are held inside early childhood schooling settings.

## **Research Questions**

The purpose to increase this line of studies, this present observe surveyed metropolitan such as in Kuala Lumpur inservice teachers about their attitudes towards a pupil with ASD in the Malaysia. The sample size turned into extraordinarily large as compared to present studies on teacher attitudes associated with students with ASD. The research questions had been:

- 1. What is the knowledge of general education teacher towards nutrition, psychological, pedagogical and information technology and communication among students with Autism in mainstream classrooms?
- 2. What are the attitudes of general education teacher towards behavior, teaching and learning, teaching aids, classroom management, subjects for students with Autism in mainstream classrooms?

#### METHODOLOGY

The study involved the development of an instrument that was used by the researcher to investigate knowledge of, and attitudes towards, children with ASD in the context of inclusive education. The questions were an attempt to operationally define attitude as the self-report of attitude shown to ASD in the context of inclusion. The aspects of attitude to be measured were a combination of affective and cognitive. The rating mechanism was a five-point Likert scale (strongly agree; agree; neither agree nor disagree; disagree; strongly disagree). A Likert scale was chosen because as Neuman (2000) pointed out.

#### Data Collection

A survey become performed to collect data about teachers' attitudes in the direction of a student with autistic diagnosis and closer to a regular student. participants had been requested to complete a self-administered questionnaire. The original intention was to identify between 100 primary school teachers in Kuala Lumpur Malaysia. They were drawn from a sampling frame of all primary schools; by writing to the Head Teacher of each of the 3 primary schools asking for maximum participation in the study by individual teachers; sending copies of questionnaires to each school and if possible carrying out follow-up interviews.

The risk of bias inside the initially proposed sample turned into identified and the real pattern potentially carried an even more risk of bias. It was feasible that teachers who were analyzing guides regarding youngsters with SEN might have greater knowledge and feel extra effective about youngsters with ASD. The risk of bias should have an effect on the external validity of the outcomes because it is able to now not be possible to generalize the findings.

Questionnaires were administered via email or by personal delivery as the quickest way of conducting a survey. Responses were collated, giving a breakdown of answers by demographics for instance, gender, age, and experience of teaching children with Autism Spectrum Disorder and aggregated responses. Responses were analyzed using SPSS and the findings are given later. However, no interviews were conducted and so it was not possible to explore the reasons why respondents held particular attitudes.

#### Data Analysis

Statistical analysis of the data was performed using the standard statistical package for the social sciences (SPSS, version 23.0). All variables were categorized and were expressed as frequencies and percentages. The chi-square test was used to evaluate any potential association between teachers' views and attitudes and the selected independent variables (teachers' ASD education and training; teachers' experience on ASD students).



Teachers' demo	graphic and working characteristics	Frequency	Percent
			%
Gender	Male	22	22
	Female	78	78
Age	25-30	31	31
	31-40	59	59
	41-50	10	10
Field	General Education Teacher	60	60
	Special Education Teacher	34	34
	Paraprofessional	6	6
Academic	STPM	4	4
	<b>Teacher Training Institution</b>	27	27
	Specialist Degree	13	13
	Bachelor Degree Education	56	56
Teacher	<1 years	20	20
Experience	1-3 years	20	20
Inclusive	3-5 years	22	22
Education	5-10 years	17	17
	10-15 years	16	16
	20 > years	5	5

Table1. Teachers' demographic data gender, age, field, academic, teacher experience of years inclusive education

Male 22.0 percent (22) higher rather than female is 78.0 percent (78). Teacher age '31-40' is percent 59 older than '25-30' age than percent of 31. Malaysian teachers field of more percent of (60) from general education teacher. Special education teacher conducted percent of (34). Teachers also academic background were percent of 56 Bachelor Degree Education. Otherwise teacher experience inclusive education classroom became 3-5 years percent of (22), one and 1-3 years were both of them percent of (20). Generally Malaysian teacher have been working whose had been experience about (62) one and 5 years into inclusive education classroom. *Reliability Test* 

Reliability Statistics	
Cronbach's Alpha	N of Items
.910	100

Reliability in the study refers to the extent to which the variables are stable and consistence with what they are intended to measure (Moran, 2006; Singleton and Straits, 2004). The reliability of the scale constructs was tested using Cronbach's Alpha to measure the internal consistency and reliability of the variables in the questions. The reliability test shows that 0.91 of the Cronbach's Alpha coefficient (above 0.70 being acceptable and not more than 0.95) according to Perry Hinton's SPSS Explained 2004.

Intra class correlatio								
Intra-class Correlation <sup>b</sup>		95% Confi	dence Interval	F Test with True Value 0				
		Lower	Upper	Value	df1	df2	sig	
		Bound	Bound					
Single Measures	.091ª	.070	.122	11.108	99	9900	.000	
Average Measures	.910 <sup>c</sup>	.883	.933	11.108	99	9900	.000	

#### Intra-class Correlation Coefficient



Two-way mixed effects model where people effects are random and measures effects are fixed.

a. The estimator is the same, whether the interaction effect is present or not.

b. Type C intra-class correlation coefficients using a consistency definition the between-measure variance is excluded from the denominator variance.

c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

As shown in Table 4.2 the Cronbach's Alpha (0.91), since, reliability analysis is concern with the internal consistency of a measurement instrument. This indicates that the scales and measurement used in this study have been adopted from previous established studies, accurate and reliable.

#### NORMALITY TEST

Normality test is one of the most fundamental assumptions in multivariate analysis and it refers to "the shape of the data distribution for an individual metric variable and its correspondence to the normal distribution" (Hair et al., 2010, p.79) According to Sekaran (2010) the bell shape distribution of dependent variable represents the normal distribution. In line with Hair et al., (2010) to examine data distribution, namely Kurtosis and skewness. The kurtosis refers to the "peakedness" or "flatness" of the distribution compared with the normal distribution and skewness is used to describe the balance of the distribution. Based on the desired significant value, the statistics value for skewness and kurtosis normally should not exceed -2.58 to +2.58 at the significant level of (p<0.01) or -1.96 to +1.96 at significant level (p<0.05). The data are considered non-normal distribution in the cases that they exceed the specified critical values. The table 4.3 below shows the result of normality test for the study.

Tests of Normality <sup>b,c</sup>		Kolmogor	Kolmogorov-Smirnov <sup>a</sup>		Shapiro-W	Shapiro-Wilk			Skewness
Knowledge Autism	Age	Statistic	df	Sig	Statistic	df	sig		
Nutrition(Diet\ Food)	25-30	.311	31	.000	-0.287	31	.000	-0.287	1.924
	31-40	.184	59	.001	0.594	59	.001	0.594	0.955
	41-50	.482	10	.000	1.054	10	.000	1.054	2.589
Psychological Autism	25-30	.185	31	.009	.859	31	.001	0.373	-2.140
	31-40	.217	59	.000	.877	59	.000	-2.207	-0.418
Teaching Learning	31-40	.262	31	.000	.852	31	.001	-1.328	1.330
Autism	41-50	.255	59	.000	.825	59	.000	-1.254	-2.019
ICT Autism	25-30	.221	31	.000	.881	31	.000	-0.681	-0.088
	31-40	.250	59	.000	.854	59	.001	-0.681	-8.789
	41-50	.482	10	.000	.509	10	.000	1.054	2.589
Biological Autism	25-30	.286	31	.000	.801	31	.000	-0.657	-2.223
	31-40	.215	59	.000	.902	59	.001	0.980	0.649
	41-50	.378	10	.000	.693	10	.000	-1.531	0.811

Table 4.3: Test for Normality Using Age

a. Lilliefors Significance Correction

b. Psychological Autism is constant when Age = 41-50. It has been omitted.

c. Teaching Learning Autism is constant when Age = 41-50. It has been omitted.

Table 4:4: Testing for Chi-square of indepen	dent variables
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	0 1		1
Variable N	Ν	Mean	Standard Deviation
Teacher Experience	100	3.04	1.510
Gender	100	1.78	.416
Age	100	1.79	.608



Using non-parametric test, an independent-Sample Kruskal Wallis Test was conducted to examine the differences between primary school teachers with and without experience of teaching student with Autism. Based on the outcome of the distribution, we test the following hypothesis: behavior/attitude and general (biological aspect) knowledge of primary school teachers in relation to their experience or no experience of teaching student with Autism. A Chi-square test of independence shows that there is no statistically significant difference in attitude and general knowledge of the teachers towards Autism students (Mean= 3.04, SD= 1.510; df= 5; p<0.05) in Table 4.5 and Table 4.5b.

Table Classroom Management Knowledge and Attitude for Autism Student Descriptive Statistics

Statement	Ν	Mean	SD	Mini	Maxi
General teachers consider students with autism have the right to	100	3.35	.520	2	4
receive all education within the regular education classroom					
General teacher's think of students with Autism should be given	100	3.54	.501	3	4
every opportunity to function in the regular education classroom					
where possible					
General teachers consider that isolation in a special classroom has a	100	.299	.772	1	4
beneficial effect on the social and emotional development of the					
student with Autism					
General teachers assume student with Autism will not be socially	100	3.33	.570	2	4
isolated in the regular education classroom					
General teachers are trained in accessing and providing useful visual	100	3.51	.595	2	5
supports (picture, boards, etc.) for students with Autism in regular					
education classroom					
Gender and Experience	100	4.8200	1.57236	2.00	8.00

Using non-parametric test, an independent-Sample Kruskal Wallis Test was conducted to examine the differences between female and male teachers without experience of teaching Student in relation to attitudes of student with Autism. Based on the outcome of the distribution, we test the following hypothesis: attitude towards classroom management in relation to their gender and experience with Autism. A Chi-square test of independence shows that there is no statistically significant difference in Attitude and classroom management of the teachers towards Autism students (Mean= 4.8200, SD= 1.57236; df= 4; p<0.05).

## RESULTS

The results of the present study demonstrate that may help general classroom teachers who lack the skills and knowledge of the inclusive education, to fulfill the needs of these autistic and mainstream students. Cassady (2011) found that the teachers who teach inclusive program were more concerned with the autistic student in the general classroom due to their problems in social skills, behavioral outbursts, changing curriculum and very little training and supports. Therefore, the teachers need to provide full supervision to the autistic students in the class in order to fulfill their needs.

On balance of this study found out that regardless of in-service teachers' positive attitudes closer to each student with ASD and typical students, their attitudes in the direction of students with ASD are significantly more negative than in the direction of typical students. Numerous factors might also underlie those attitudes. One possible aspect is the higher tiers of behavioral and emotional problems in school exhibited by means of students with ASD as compared to their commonly growing peers (Ashburner et al., 2010). That crucial issue is the anxiety that could rise up in the classroom from autistic manifestations consisting of difficulties with social and emotional expertise, thereby impacting teacher-pupil interactions and teachers' perspectives of supports needed for effective classroom management (Emam & Farrell, 2009; Robertson et al., 2003). Therefore, trainer attitudes closer to youngsters with



ASD may additionally reflect the very real challenges instructors face in educating and interacting with those students.

The data would seem to suggest that teacher gender is the second one predictor of a teacher's attitudes in the direction of a pupil with ASD. The result is consisting with Park and Chitiyo's (2011) finding that female teachers are much more likely to exhibit positive attitudes closer to a pupil with ASD. As Park and Chitiyo (2011) posited, socialization differences in empathy can also activate females to display greater positive attitudes in the direction of students with ASD. The function of gender in teachers' attitudes closer to college students with ASD is a critical difficulty that wishes in addition research, particularly in mild of the fact that the general public of students with ASD are males.

According to Finch et al. (2013) Training needs to also include increasing educator knowledge of special education, specifically in the area of ASD. An identification of needs, areas of concern, and proper instructional practices for inclusion of students with ASD is missing from general educator's preservice and professional development education. Research is lacking in the following key areas of inclusion training found to be beneficial: collaboration between general and special education teachers, education to increase educator's knowledge base in the area of special education, and implementation of professional development opportunities. (Finch, 2013) General education teachers trained to collaborate with special education teachers provide a balanced education and a more positive inclusive environment. Collaboration allows general education teachers to recognize pupil expectations and needs (Conderman & Johnson-Rodriquez, 2009). Strategies and examples of collaboration among general and special educators can enhance inclusive classrooms (Lingo, Barton-Arwood, & Jolivette, 2011; Moore, 2009). Besides, collaboration affords general training teachers with the knowledge, background currently provided broadly speaking to their special education cohorts, as a result increasing their effectiveness and meeting their educational needs.

All of this points to the fact that, the most effective significant difference that turned into found became that teachers with experience of teaching SEN students had extra knowledge approximately ASD than did teachers without such experience. However, there was no extensive distinction among these groups on attitude ratings, nor were any substantial differences found, according to age or gender variations were observed on attitude or understanding rankings. This in itself is interesting, as a few correlations among knowledge and attitude might be predicted, also some correlation between enjoying and effective attitudes (Alenizi, Mogbel Aid K. 2015). The motives for a lack of correspondence within the regions might advantage similarly research, because the findings from this small and albeit biased sample would relate to recommend that enjoy and observe make little distinction for teaching in practice.

## CONCLUSION

The arguments given above prove that general teachers, should be provided professional development in working with students with ASD in order to possibly enhance their attitudes toward this student population. Potential training components include characteristics of ASD and the theoretical knowledge, evidence-based instruction, and intervention practices for students with ASD.

Knowledge of ASD is lacking in public school teachers in Malaysia, and greater teacher training and instruction is needed. Nonetheless, teachers report a willingness and motivation to gain the skills needed to maximize the educational experiences of children with ASD. Teachers' education and ASD training and relevant past experience in working with ASD students appear to be the most efficient 'tools' that can inspire a teachers' willingness and empower them with self-esteem, that is fundamental in confronting the everyday problems of ASD students

Teacher educators, both at the initial and continuing professional development levels, have a role to play in challenging teachers' implicit understanding of inclusive education, as well as their role perceptions and professional actions in respect of these students. Teacher educators could assist teachers in enabling the student

body as a whole to acknowledge, accept and accommodate perceived student differences. Furthermore, teacher educators could enhance the teachers' knowledge of appropriate pedagogies to meet the needs of students with ASD in mainstream schools.

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# Teachers' Attitudes on the Use of Mother Tongue in the Curriculum: A Case Study of Schools in Motheo District, South Africa

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# ABSTRACT

This study is based on the findings conducted to investigate attitude of teachers towards the use of indigenous languages in teaching in Motheo district, South Africa. Eight schools out of 52 public schools were randomly sampled. This study is thus a case study in which interviews were conducted to collect data from forty Grade 1-3 teachers; in order to find out the actual practices in their classrooms, the challenges they come across to, and the perceptions they held in relation to the use of mother tongue in their teaching. The data were qualitatively analysed and the emergent findings support the claim that the use of learners' mother tongue is beneficial to learners. The implications of these findings are discussed and the recommendations are proposed for pedagogy. **Keywords:** Mother tongue education, language of learning and teaching, perceptions and attitudes

# INTRODUCTION

The apartheid era in South Africa was characterised by a language policy that did not officially recognised indigenous languages (L1) spoken by the majority of the population. In 1994, the government recognised the significant role played by the mother tongue in learning, thus an educational language policy raised the status of indigenous languages. According to the official language policy of the 1996 Education Act and Department of Education (2002), children in Grade 1 - 3 are to be instructed in their first language, and learn English (L2) as one of the subjects on the curriculum. From Grade 4 onwards, English becomes the language of instruction.

According to research and literature (Borich and Tombari, 1997; Ndamba 2008; Mofokeng 2013; Bachore 2014; Ganuza and Hedman 2015) this language policy can be identified as a possible model for bilingual education. The continued use of English as a medium of instruction in teaching Mathematics means that no scientific ideas can be formulated using *Sesotho* in the present schooling system leading to perpetual scientific bankruptcy (Phindane 2015: 107).

In South Africa, parents are permitted to choose the language in which their children are to be educated (Department of Education 2002); but the majority of parents demand that their children are educated in English (Heugh 2010). This is partly due to global prestige of English as a medium of international communication, language of business, and pre-requisite for employment (Buthelezi 2003). Bilingual indigenous-English speaking children often have early verbal input in indigenous language; and English is introduced once they enter school and develops subsequently through English literacy instruction (Ndamba 2008; Khosa 2012). The language situation of these children is termed both emergent bilingual and English second language learners (EL2) as they first encounter a new language when they go to school and have limited oral proficiency in that language (Bialystok et al. 2005; Bachore 2014), as opposed to other bilingual learners who have encountered both languages before scholastic instruction begins. Not much work has been done on parents and pupils' language preferences in a bilingual set up at the elementary level in South Africa.

# RATIONALE

This study sought to establish the teachers' perception on the use of African languages in the curriculum, highlights the challenges that are faced in the teaching of such languages, and argues for the preservation, development, and use of instructional material in African languages. The impetus of the study came from the strong evidence from research findings which indicate that the mother tongue plays a crucial role in the teaching and learning of bilingual children during early years of schooling.

The role of indigenous languages in national development must not be undervalued particularly because they are the means by which different groups within society maintain their identities. The objective of learning these languages should be to promote, foster and propagate the cultural heritage. Such languages will help the learners retain strong ties with their culture; their heritage. Indeed the greatest and most important gift a parent can give a child is to pass their language and culture. Thus, indigenous language teaching should lead to a deeper sense of cultural pride and self-awareness, giving the learners social identity. The learner is, therefore, socialized into a culture of his or her language. If learners lose their mother tongues in their early years, they are also losing a part of their culture, resulting in the stripping of their identity. Secondly, linguists believe that if pupils do not fully acquire their first language, they may have problems later in becoming fully literate and academically proficient in the second language. This is supported by evidence from research which indicates that pupils learn academic material and other languages most successfully when they begin school in the language they speak most comfortably (Hornberger, 1996 and Cummins, 1996). The interactive relationship between language and cognitive growth is very significant. This implies that everything acquired in the first language (academic skills, literacy, concept formation, and learning strategies) will be transferred from first language to the second language. That is, the first language will act as a foundation to the learning of other languages.

In addition, intellectual independence is an important condition of achieving economic, social, and political independence (Kamwangamalu, 2000). The usage of African languages in education and teaching is a prudent way to achieve intellectual independence. It is on that point of view that this paper argues that the usage of African languages in schools will help in promoting African students' academic growth and develop in them a strong sense of confidence.

Moreover, African languages, when used in schools, act as a link between home and school. Their own languages enable young learners to immediately construct and explain their world without fear of making mistakes, articulate their thoughts, and add new concepts to what they already know. Therefore, those who come to school with a solid background in their mother tongue develop literacy in the school language, since both languages will nurture each other when the educational and home environment permit children access to both languages. On the other hand, Abiri (2003) postulates that mother tongues also play a profound role in the psychosocial development of the individual and therefore early use of the languages will help expand the learners' verbal facility and cognitive realm. Mohanlal (2001) claim that a good education is that which draws from the learners' ethnocentric and eco-centric values. This postulation lends credence to the commonly held belief that it is only the mother tongue education that fully meets this requirement. But are the teachers entrusted with this responsibility aware of the benefits of using the learner's first language as the medium of instruction? What are their attitudes toward mother tongue education? These are some of the questions that this paper purposes to answer.

# **Research Questions**

This study was designed to find out the views of teachers on the use of African languages as the medium of instruction in South African schools. It sought answers to the following questions:

- a) What challenges do teachers face when teaching in the mother tongue?
- b) What are the teachers' perceptions as regards use of the tongue as a medium of instruction?

# LITERATURE REVIEW

# **Attitudes toward Mother Tongue Instruction**

The positive outcomes of a mother tongue instruction policy depend on people's attitudes towards the first language and English second language. Also to understand how attitudes towards a language develop, it is necessary to consider the social and political history of a nation, since such historical forces play a significant role (Bamgbose 1991; Robinson, 1996; Khosa 2012). Thus, the apartheid and the post-apartheid language and educational policies obviously provide a solid basis of the explanation of attitudes towards African languages, and English second language (Silva 1997; Bamgbose 1991; Roy-Campbell 1996; Barnes 2004; Adegbija



1994; Desai, 2001; Rahman and Asmari 2014). The apartheid language policies either adopt the use of Afrikaans/English from the first grade or only used indigenous languages as a medium of instruction in the lower classes of the primary school.

In the apartheid era, South Africa was officially considered a bilingual state, with English and Afrikaans as the sole official languages of the state. With the demise of apartheid in 1994, the new government has adopted a multilingual language policy giving official recognition not only to English and Afrikaans but also to nine African languages: Xhosa, Zulu, Ndebele, Swati, Tswana, Sotho, Pedi, Venda, and Tsonga. One of the main objectives of the new language policy has been to promote the status of the nine African languages by, among other things, using them as media of learning.

Six years after the policy was enshrined in the country's new constitution, it seems that not much progress has been made yet in attempts to implement the policy, especially with respect to the issue of mother-tongue education. Rather, the status quo prevails: English and Afrikaans remain the media of learning in English-medium and Afrikaans-medium schools, respectively, much as they were in the apartheid era. The African languages are offered as media of learning from first through fourth grades in predominantly black schools, after which English not Afrikaans because of its association with apartheid takes over as the instructional medium. Attitudes can be created through functions that people perceive particular languages as performing.

In the African context, Phindane (2015), is of the opinion that official and local languages are regarded as opposed to each other, rather than as complementary as evidenced by the fact that one of the two languages may be regarded as a more suitable language for certain domains, and the characteristic functions are seen in dichotomous terms. Ndamba (2008) says the local languages are characterized by oral usage, individual/community usage, emotional attachment, village solidarity and personal loyalties. English language is characterized by institutional usage, written usage, functional use, economic advantage and national communication. English as an official language has therefore been associated with the success, power, prestige, progress and achievement, and such associations have generally resulted in English getting a high positive evaluation (Ndamba, 2008).

# Learner Attitudes

In South Africa, the situation is not different. South African learners who were interviewed by Setati (2005) and Langa and Setati (2006) preferred the use of English in the learning of mathematics in the secondary school. These researchers attributed learner choice of the language of instruction to the socio political situation. These learners did not see value in their African languages as they do not have any social and economic benefits. In September 2009, the Minister of Higher Education, Blade Nzimande said that those taking up African languages at University level were sometimes perceived by their peers as 'second-grade students' (Sapa 2009). These are few examples of learners' attitudes towards English as a medium of instruction.

Barkhuizen (2002) examines high school students' perceptions of the status and role of Xhosa (an indigenous African language) and English in the educational context. He surveys 2825 students in 26 high schools throughout the Eastern and Western Cape Provinces. These Xhosa high school students were being instructed in their mother tongue and also learning English as a second language. It was discovered that students had a preference for English as a second language. Dyers (1999) in her study of Xhosa university students' attitudes towards South African languages observed a similar pattern. The two studies, however, did not look at how teachers perceived the use of the mother tongue as the medium of instruction.

#### Parental and Community attitudes

Iyamu and Ogiegbaen (2007) looked at parents and teachers' perspectives of mother-tongue medium of instruction policy in Nigerian primary schools. Questionnaires on the subject were administered to samples of 1000 primary school teachers and 1500 parents of primary school children. They found out that many inadequacies of Nigeria's schools stem from their religious and colonial past which seems to have put a lot of premium on the language of the colonizers to the detriment of African languages.



Ejieh (2004) looks at the attitudes of student teachers toward teaching in the mother tongue in Nigerian primary schools. Data for the study were gathered by means of a questionnaire administered to 106 students in a Nigerian college of education. It was found out that the students had a generally negative attitude towards teaching in the mother tongue. These studies on mother tongue teaching and others conducted in other contexts have succinct valid beliefs about their people's experiences and attitudes towards the use of indigenous languages in teaching.

In South Africa, research carried out by Ngidi (2007) and Ndamba (2008) revealed that parents from schools of Mthunzi circuit (KwaZulu- Natal) had positive attitude towards the use of English as language of learning and teaching and as additional language in schools. Then parents of children from Navilsig Secondary school regarded Sesotho second language as being of no value to their children's lives since it did not render a person employable (Phindane, 2015). The same sentiments were expressed by children of parents concerned. These parents had no objection to their children learning English which they felt was more important for the future of their children. Part of this study focused on learner's language preferences since these children are the direct beneficiaries of language policy which recognizes the significance of learning in the mother tongue in the lower grades. Parents' views were also sought to establish if there is consistency between language policy and parents' perception of the role of the mother tongue in teaching and learning.

# METHODOLOGY

This study adopted a qualitative survey design. An interview schedule was used as a data instrument for this study. The teachers were asked questions and their responses written down. Later, these recordings were analysed to determine teachers' perceptions on the use of African languages in the South African curriculum and the emerging patterns are then discussed. Further, the challenges that teachers undergo in the course of their teaching as far as teaching using two languages (English and Mother tongue) are discussed and recommendations on how the challenges can be mitigated are suggested.

### Sampling procedure and sampling size

The research randomly sampled 8 schools out of 52 schools as well as the 44 teachers. In view of the fact that the research dealt with the perceptions of teachers on the use of African languages in the curriculum, the dichotomy of gender was factored in so that 22 teachers were males and the other 22 were females. The teachers were carefully chosen so that only those who could read and write in English and Sesotho were selected. A sample of 44 teachers was considered representative since there is a strong indication in the field that large samples tend to bring increasing data handling problems with diminishing analytical returns (Milroy, 1987). Since our interview schedule consisted of 8 questions and our sample comprised 44 teachers, we expected to analyse 352 items.

#### **Data collection**

An interview schedule was presented to the 44 teachers of Grades 1-3. The introductory section of the interview schedule helped in getting the bio-data of the respondents viz name, sex, and age. The interview schedule comprised both the open-ended and close-ended. This helped the researcher to understand the perceptions and logically structure them for analyses.

#### **Data collection instrument**

The instrument used in this study was an eight-item interview schedule. The questions sought the opinions of the teachers on some issues and problems related to teaching and learning in African languages. These questions included teachers' opinions on the possibility of teaching all school subjects in African language, the benefits of teaching and learning in the mother tongue to pupils, and some of the limitations of imparting education in the mother tongue.

Items 1 and 2 sought the teachers' opinions on whether all the subjects in class are taught using the mother tongue and whether pupils in school found it hard to make a switch to English at Elementary Grade Four. Item 3 sought their opinion on whether they were trained on how to teach the mother tongue at teacher training college.



Item 4 sought their opinions on whether they teach Mathematics using the mother tongue and whether pupils seem to understand better than they would if they were taught in English. Item 5 sought to know whether parents mind the medium of instruction used in teaching being English or the mother tongue. Item 6 sought to know whether there are benefits of teaching pupils in lower primary and nursery school in the mother tongue while item 7 sought their views on whether they would recommend that teaching in schools be done in the mother tongue. The last item sought their view on whether they would want the South African Language Education Policy changed so as to allow teaching of all children in English right from kindergarten.

## RESULTS

Both men and women respondents had similar observations in relation to the questions in the interview schedule. The responses to each item are presented below.

### Item one

The research found out that all the 44 teachers mostly use the mother tongue in their teaching. Interestingly, the research also found out that teachers use the 2 languages (English and mother tongue) in the classroom teaching and learning. In most cases, code-switching practices play an important role in many South African classroom environments, although they can never be said to constitute a viable alternative to the development of formal academic proficiency in the African languages.

Code switching, the mixing of words, phrases, and sentences from two distinct grammatical systems across sentence boundaries within the same speech event (Bokamba 1989) is a regular phenomenon in multilingual settings. In this connection, Abdulaziz (1971) reports that mixing of languages occurs in many schools in almost all environments from an early age. He argues that this is probably necessitated by the dearth of materials to teach all subjects in the mother tongue and similarly the pupils do not understand English as used in the school texts. This scenario was the case in the schools visited. The learners did not understand some concepts in English. Thus the teacher switched to the mother tongue and the learners would say, "*kgidik*", surprised that what they had found incomprehensible was so easy to understand when communicated in their mother tongue

#### Item two

On whether pupils found it easy or hard to make a switch to using English at Primary Grade 4, all the 44 teachers indicated that their learners faced difficulties and that most learners drop out of school at this level. They find the curriculum too hard to follow, hence they opt out.

#### Item three

It emerged from the data analysis that teachers are not trained on how to teach the mother tongue or how to teach using the mother tongue. The syllabus in the teachers training colleges is silent on this and does not include any guidance on mother tongue education.

#### Item four

The teachers reported that when they used the mother tongue to explain some mathematical concepts, learners understood better than when the same are explained in English. One teacher explained how difficult it was for her to explain the concept of 'division' using English. When she switched to the learners' mother tongue, they all understood more easily.

#### Item five

The teachers reported that parents wanted their children taught in English from Primary Grade 1 since they felt that this would give their children a head start, now that English is an important language in South Africa. This situation could be the case due to the fact that English enjoys more functional privileges than Sesotho and other indigenous languages in South Africa. English is thus seen as the key to economic and educational advancement. The language is accorded very high status and has overall dominance in many spheres that are associated with modernization. The language is thus associated with power and elitism and is a major asset in social mobility.



#### Item six

All the 44 teachers were in agreement that the use of mother tongue as the medium of instruction in school is beneficial to learners. This finding concurs with the consensus among researchers and practitioners that children learn best in the mother tongue since it helps to bridge home and school experiences. The World Bank Report (2000), for example, notes that learners are more likely to participate actively in the classroom when the language of instruction is the local language.

The teachers interviewed noted that the level of development of children's mother tongue is a strong forecaster of their second language development. Children who come to school with a solid background in their mother tongue develop literacy in the school language. African languages teaching also enables parents and teachers to work together to support the learning which takes place at school while at the same time encouraging first language development and support through storytelling, sharing books and reading in the mother tongue.

Teachers perceive mother tongue as a means of promoting cultural heritage. As noted out earlier in the rationale, using an African language as a medium of instruction leads to a deeper sense of cultural pride and self-awareness giving the learners social identity. This is because indigenous languages have a wealth of knowledge concerning the local ecosystem and act as a "repository of a polity's history, traditions, arts and ideas." (Kamwangamalu, 2000).

Teachers noted that mother tongue education is effective in helping the child to understand his environment. This view is in consonance with the opinion of Mohanlal (2001) that a good education is that which draws from the learners' ethnocentric and eco-centric values. It was also found out that African languages help children understand the environment and helps them recognize their own mother tongue as a source of identity, thought, and instruction (Phindane, 2015).

Teachers also stressed that mother tongue facilitates acquisition of second language and third language learning. This finding concurs with what research has consistently shown that learning to read and write in the mother tongue facilitates access to second language learning (Heugh, 2002; Brock-Utne, 2000; and Grin, 2005). Therefore, the teacher of a second language can make his/her job easier by creating conditions for students to reactivate these study skills and learning strategies and apply them to their study of a new language so long as the child has the vocabulary to reproduce it in that second language. Urevbu (2001), an expert in curriculum studies in Nigeria, believes that early education in the mother tongue enhances a child's cognitive equilibrium.

The mother tongue is also perceived as a guarantee of security for the pupil. This is because language gives the individual a sense of belonging and ownership. When a child cannot competently use a language, her/his self-esteem is negatively affected, making the child insecure. In the view of the teachers, learners are passive and take long to respond if they are asked questions in English and are expected to use English in their responses. That is, they view English as a strange tongue. For example, one of the teachers interviewed informed the researcher that when the pupils are asked questions in the two languages, that is, English and the mother tongue (*Sesotho*), they would exhibit different behaviour. For instance, if they reported to school late and were asked:

1. Why are you late? (question asked in English)

2. Hobaneng ha o le morao ho nako? (question asked in Sesotho)

Pupils would keep quiet if asked question (1), while all the learners would understand question (2) and respond correctly. Therefore, when teaching is done in English, learners are confused and many of them do not understand what is being taught because at Grade 1-3, they have not received much input in English.



#### Item seven

In view of the above benefits of mother tongue education, all the teachers recommended that teaching, especially in the early years of formal learning, should be done in their mother tongue. Teachers observed that lessons in a foreign language are mostly teacher centred especially in primary schools, since learners have not acquired reasonable proficiency in the target language. Therefore, the use of the mother tongue or a familiar language facilitates the use of effective, child-centred teaching practices which encourages learners to be active and become involved in the subject matter. Alidou and Brock- Utne (2005) is an example for such an approach.

The teachers further reported that the child becomes more confident and expresses himself/herself best in the mother tongue than when using a second language. This finding agrees with Lameta- Tufuga (1994) who found out that if learners are given a chance to discuss a task in the first language before they had to carry it out in writing in the second language, they will do the task well. This is because the learners will be very actively involved in coming to grips with the ideas and hence making school less traumatic.

Secondly, the first language discussion will facilitate acquisition of second language vocabulary which would be used in a later task. Therefore, it is imperative that when a teacher feels that a meaning based second language task might be beyond the abilities of the learners, a small amount of first language discussion can help overcome some of the obstacles. Therefore, from a pedagogical point of view, school results are plausibly better when children are taught in their mother tongue.

#### Item eight

Teachers did not recommend the change of language in education policy to have the language of instruction from Primary Grade 1 being English. They argued that the benefits of teaching children in their mother tongue during the early years of formal learning outweigh the advantages of teaching them using English as the medium of instruction. However, the teachers were aware of several challenges that need to be countered for mother tongue education in South African schools to be a reality.

#### CHALLENGES OF ADOPTING MOTHER TONGUE EDUCATION

According to the teachers interviewed, one of the challenges encountered in attempt to implement the use of mother tongue education policy in South Africa is the lack of enough teachers trained to teach the various mother tongues spoken in the country. As Phindane (2015) points out, primary school teachers in South Africa are not trained in teaching in mother tongue. On the other hand, Wolff (2006) notes that language teachers, whether of English or African languages, must be exposed to the general methodology of teaching language for effective teaching in the said languages.

Secondly, teachers felt that there is profound lack of instructional materials in African languages. This observation concurs with Okombo (2001), who notes that reports of the unavailability of instructional materials in indigenous languages are very common, even in the child's first three years of primary education. In order to lessen the paucity of literature materials, Rubagumya (1986) feels that the state should assist various groups in producing reading materials to minimize the problem. According to Kembo-Sure, Mwangi, and Ogechi (2006) English books normally take the lion's share in the publishing industry. Mother tongue books are rarely published. Fagerberg- Diallo (2001), on the other hand, feels that the availability of attractive reading materials will contribute to increasing the demand for literacy courses.

The teachers further commented that there is also an apparent lack of enthusiasm for African language teaching in South African schools. This remark tallies with Wolff's (2006) observation that one of the major problems that blocks progress towards African languages is the continued lip service to the importance of African languages. The maintenance of education systems which systematically exclude the use of the majority's vernacular languages can no longer be justified by politicians (Elwert, 2001). Coulmas (2001) argues that giving up social and cultural pride is one of the "costs" of literacy. Learning to be literate in a second, international language at the expense of an indigenous vernacular language is one of the sacrifices in building a more literate society. On the other hand, Heugh (2005) opines that learning indigenous languages is relevant and sustainable by itself and that it is inappropriate and costly to pay lip service for the sake of economy of scale (see also Grin, 2005).



In addition, there was an observation that teachers using African languages as a media of instruction lack interpretive and translation skills that may help nurture learners for higher learning. On the other hand, while learners may have attained a certain level of basic interpersonal communicative competence in African languages, they lack what Cummins (2000), for example, termed cognitive academic language proficiency, and thus they are unprepared for higher education or for training in a sophisticated work environment.

Another challenge to African language teaching, according to the teachers interviewed, is that the use of several mother tongues is misconstrued as accentuating interethnic conflict. English, being the dominant language of international business and economic development, continues to flourish with the continued globalization of business and international investment.

As such, the respondents noted that most teachers, parents and pupils look at African languages as inferior. This defeatist attitude towards use of indigenous languages for education may be connected to the inferior position accorded to African language during the colonial era. It has been argued that because of the status attached to the European languages, some Africans educated through them shun their mother tongues (Sure & Webb, 2000). In addition, some Africans believe that indigenous languages cannot be used for any serious conduct of scientific and technological affairs (Okombo, 2001). They, therefore, look at English as a language that helps bridge communication gaps between people. However, this only helps to threaten the continued existence of many mother tongues.

The respondents argued that a number of South Africans view English as a status language with many benefits (Phindane, 2015). However, teachers, parents, and their children must be made to see that the use of African language in education leads to palpable benefits in economic empowerment, social mobility and influence and pathways to further academic opportunities (Kamwangamalu, 2000; and Githiora, 2008). Therefore, its deployment often serves to establish formality and social distance between interlocutors. Stakeholders in the education sector must be convinced of the benefits of vernacular languages' teaching, not merely in a cognitive sense, but in a much larger socio-economic context.

A few teachers though, the respondents observed, consider African languages as obstacles for the learning of English. This position is also shared by some linguists like Marton (1981). Marton maintains that from a psychological perspective not only at the moment of cognition but also when amassing fresh knowledge for his/her 'linguistic reservoir', the pupil is faced with a belligerent conflict between his native language and the second language system. However, research evidence shows that the level of development of children's mother tongue may be a strong predictor of their second language development (Cummins, 2001), and that teaching and learning in mother tongue facilitates learners' cognitive and affective development (Kembo, 2000 and Thondhlana, 2000).

# RECOMMENDATIONS

Standardized textbooks, support materials, teaching aids and literature must be made readily accessible in African languages and kept continuously up to date. This is particularly appropriate in the fields of humanities, mathematics, science, and technology where new terms will have to be developed and communicated to the learners. It is imperative, therefore, that standard written forms in African languages need to be modernized, regularized, codified and elaborated.

Trainees should undergo thorough training in African languages and the language content in the syllabuses should reflect the social, political and economic philosophies aspired for. In the government domain, policy 0.issues should be written in the language understandable by the people and in a style that embodies the culture of the people.

The government in partnership with the Department of Higher Education and Training and other stakeholders should not only come up with the African language school curriculum at the primary, secondary and at tertiary levels, but should also revise and modernize the entire teacher education curriculum (including the undergraduate Bachelor of Education programs) at our universities.



Translation of other literature materials covering mathematics, sciences, philosophy, and other disciplines would also be undertaken so that even such specialized disciplines are not left in the dark. The government and nongovernmental agencies need to support and finance literature in African languages by organizing workshops and seminars and providing grants to publishers and authors.

# CONCLUSION

This paper attempted to present the perceptions of teachers on the use of African languages (learners' mother tongues) as media of instruction especially in the early years of formal learning. The general finding is that the teachers interviewed noted that African languages had a significant role to play in education. The paper has highlighted some of the benefits of using mother tongue media in teaching as far as concept formation and comprehension are concerned, as seen from the teachers' perspectives. It has also looked at some of the challenges that need to be countered and made some useful recommendations that will facilitate a change of attitude among teachers, parents, and learners in relation to the use of mother tongue as a medium of instruction. Because of the many benefits to the learner that are associated with mother tongue education, as shown by research evidence, the respondents felt that attempts should be made by policy makers, educational administrators, and planners to empower teachers to develop positive attitudes towards African languages.

Teacher education programs in training institutions should be restructured to reflect major indigenous languages in South Africa. Further, teacher trainees should be trained on mother tongue education so that teaching the same in the primary schools will be easy and effective. All the teachers were in agreement that there is a great need to promote African languages by putting in place and fully implementing language in education policies if all the benefits are to be realized.

The implementation of such policies will be meaningful if the African languages are developed extensively and aggressively through programs in the print and electronic media. That way, their cultural richness will be sustained and developed. Although this study provides useful information about the perceptions of teachers on the use of the mother tongue in the curriculum, the generalizations that are made are not conclusive. The findings of this research, therefore, may need to be validated by further research.

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# **Teaching Efl Grammar to High School Students in Ecuador: A Comparison Between Deductive and Inductive Approaches**

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# ABSTRACT

The present study had the purpose of testing two methods to teaching grammar in the EFL class: the deductive and inductive approaches in terms of effectiveness and rapport in class. This study was conducted in a public high school in Ecuador. Thirty five students enrolled in one class of the second year of senior high school participated. One in-service teacher taught the EFL classes during the process of intervention and two EFL teachers observed all of these classes and recorded the information by filling in observation sheets. The students were administered grammar pre-tests and post-tests in order to assess their grammar knowledge. After a statistical analysis of the data obtained from the tests and observation sheets, the results showed that the inductive approach is more effective to teaching grammar in EFL classroom in terms of instruction and rapport. **Keywords:** Inductive approach, Deductive approach, EFL teaching, rapport, teaching grammar.

# **INTRODUCTION**

Teaching grammar in an English as a Foreign Language (EFL) class plays an important role, mainly in terms of enabling students to achieve linguistic competence (Huang, 2005). In order for students to attain linguistic competence in the second language, an issue has been finding a suitable method to teach grammar (R. Ellis, 2006; Thornbury, 1999). One of the most controversial and unanswered questions regarding effective language learning is the issue of whether grammar is taught deductively or inductively. This implies that the debate has always been how grammar should be taught explicitly, through a formal presentation of grammatical rules, or implicitly, through natural exposure to meaningful language use (Nassaji & Fortos, 2011).

In this regard, Larsen-Freeman (2015) investigated whether students learn language rules best by giving them information deductively or by reading textbooks, or if students are better off being given examples from which they find out the rules inductively themselves. One learning approach would favor induction, with the added benefit that students learn how to figure out the rules on their own. She also states that repeated exemplars might at some point lead students to induce a rule, but it is equally possible that language-using patterns remain as instances in learners' memories, emerging as they do from the language that both language learners and fluent speakers of the language experience. The suggestion is to give students reasons as an alternative to rules, which may seem arbitrary, but they allow learners to see why things are the way they are; thus, reducing the opportunity of grammar explanations (Larsen-Freeman, 2000).

Another important issue that contributes to learning in the English classroom is rapport. Good rapport between students and teachers would be beneficial to rise students' motivation and interest in the classroom (Bouras & Keskes, 2014). Since grammar is a controversial and difficult aspect of EFL teaching, it is important to maintain an appropriate rapport in the EFL classroom at the moment in which grammar is explained and practiced. Rapport is essential in establishing a relationship between teachers and students and maintaining it in order to work and learn well together. This relationship allows them to enjoy one another and the class, and students feel more motivated to do their best (Paterson, 2005).

The proposal of this study was to try both approaches (inductive and deductive) to teaching grammar in order to determine which one of them is more effective in the EFL classroom, since according to information obtained from the authorities of the institution under study, students do not obtain the desired results when it comes to an appropriate level of EFL proficiency.

Therefore, the present study focuses on exploring the difference in effectiveness between the inductive and deductive approaches to teach grammar in the EFL classroom. Additionally, the effectiveness of the rapport that is established during the English lessons was also assessed. The research questions to be answered were the following:

Which of the two approaches is more effective for teaching and learning EFL grammar?
How effective is rapport when teaching EFL grammar deductively and inductively?

# LITERATURE REVIEW Teaching grammar inductively and deductively

In the context of language teaching, grammar is a key component of language. Huang (2005) states that the main goal of grammar teaching is to enable learners to achieve linguistic competence in order to be able to use grammar as a tool or resource for understanding and producing efficient, effective and proper oral and written discourse.

Teaching grammar in EFL has been considered a controversial area of language, teaching and learning (Petraki & Hill, 2010). This debate has been centered on issues such as the way grammar has been taught, its communicative purposes, whether to teach grammar at all, what sort of grammar to teach, the effectiveness of explicit or implicit grammar, or if teaching it in context or not, whether it is advisable to teach it from rules or from examples, if teaching it descriptively or prescriptively, etc. (E. Ellis, 2006; Thornbury, 1999).

However, Thornbury (1999) highlights three main approaches to teaching grammar: teaching grammar from rules, teaching grammar from examples and teaching grammar through texts. Teaching grammar from rules involves the deductive or rule-driven approach, which starts with the introduction of a rule followed by examples in which the rule is applied. Teaching grammar from examples is related to the inductive or rule-discovery approach that starts with some examples from which a rule is inferred. Teaching grammar through texts is based on the principle that language is context-sensitive, that is, the intended meaning of a word or phrase is very difficult to determine without a context. In this approach, learners need to be exposed to the context by using texts in order to make sense of the grammar learned.



One of the problems of the use of texts is that beginner or elementary learners might find difficult to understand grammar in a natural context. In addition, taking words, sentences and texts out of contexts threatens their intelligibility.

Due to the weaknesses of teaching grammar through texts to beginners or elementary learners, this study emphasizes the use of deductive and inductive approaches to teach grammar to EFL students in high school, particularly, young adult beginners.

Deductive teaching is a traditional method in which information about the target language and rules are given at the beginning of a class and continue with examples. The principles of this approach are generally used in classes where the main target is to teach grammar structures. For instance, these principles are convenient for classes in which grammar translation method is applied (Nunan, 1991). According to Thornbury (1999), a deductive lesson should start with a presentation of the rules by the teacher. Secondly, the teacher gives examples by highlighting the grammar structures. Then, students make practice with the rules and produce their own examples at the end of the lesson. In fact, the expected outcome of a deductive approach sees the need to teach grammar in an explicit way to help learners to be aware of the grammar rules (Shrum & Glisan, 2016).

On the other hand, Nunan (1999) identifies the inductive method as a process where learners discover the grammar rules themselves by examining examples. In an inductive approach, it is also plausible to use a context for grammar rules. That is to say, learners explore the grammar rules in a text or an audio rather than in isolated sentences. Furthermore, Thornbury (1999) states that in an inductive approach, learners are provided with samples which include the target grammar that they will learn. Then learners work on the examples and try to discover the rules themselves; students obtain the grammar rules and they practice the language by creating their own examples.

Teaching grammar to EFL learners after the critical period has some important pedagogical implications, since, as Brown (2007) explains, adult learners tend to deal with the rules when they use the target language because their mentality is able to think of abstract items. He points out that deductive teaching is more appropriate for adult learners since it meets their expectations as they give more importance to rules when they use the language; thus, presentation of grammar rules firstly is more useful for them. On the other hand, young learners are successful in exploring grammar structures from the examples rather than learning them deductively since students are more attracted to learn by doing because grammar rules are complex and abstract for them.

# **Rapport in the EFL classroom**

There are three motivational conditions that are important at the moment of teaching: appropriate teacher behaviors and a good relationship with the students; a pleasant and supportive classroom atmosphere, and a cohesive learner group with appropriate group norms (Dörnyei, 2001). Since motivation is important in the teaching-learning process, it is essential to establish good communication between teacher and students to achieve a successful and positive teaching and learning process (Barmaki, 2014). This enjoyable and respectful relationship of communication is called rapport, which involves a balanced interaction and trust between teacher and students (Harmer, 2007).

According to Dörnyei (2001), EFL teachers can implement strategies in the classroom for building rapport such as greeting students, remembering their names, noticing interesting features of their appearance, learning something unique about each student, asking them about their lives outside school, showing interest in their hobbies, recognizing birthdays, moving around in class, including personal topics and examples, and sending notes/homework to absent students.

Proper rapport between the teacher and students involves harmonious understanding of each other as individuals, based on mutual respect and esteem. On the other hand, behavior by teachers, which indicates that they have little respect or esteem for students, will inevitably undermine the development of good rapport. In other words, rapport is one of the teacher's qualities for a "sound relationship between a teacher and pupils" (Kyriacou, 2009, p. 109).



#### **Previous studies**

Mohammed and Jaber (2008) investigated the effects of using inductive and deductive approaches and the interaction between the type of approach for teaching the active and passive voice in English as a foreign language. This is an empirical study that included a pretest, two lessons for each group in the three classes and a posttest. Three classes of students participated with a total of 93 university students. The classes were divided randomly into two groups: one group was taught the passive and the active voice by deductive approach and the other group by inductive approach. Those who were taught deductively were exposed to specific grammatical rules where they paid conscious attention to language so as to understand such rules. Those who were taught inductively were given examples without being exposed to such rules. Instead, they were left to induce the rules by themselves. The results of the study reveal a significant difference between the two approaches in favor of the deductive group, but there is no significant difference between classes for the same type of approach.

Dang and Nguyen (2012) explored the effects of indirect explicit grammar instruction on EFL learners' mastery of English tenses. The participants were 94 eleventh-graders that were selected using purposeful sampling and were randomly assigned into either the experimental group (EG), who learned grammar through the indirect approach, or the control group (CG), who worked with the direct approach. A pre-test and post-test were administered to collect the data. Tests related to rule analysis, grammar, and speaking were also applied. A delayed written test was given to both groups to assess students' retention of the structures learned; in addition, a questionnaire was provided to the EG to investigate their perception on the treatment. The findings indicated positive results for indirect explicit grammar instruction. The EG significantly outperformed the CG in the analysis of grammar rules and the oral proficiency, except for the use of grammar structures in a pre-defined context. Therefore, there was a positive correlation between the grammar rules and their subsequent use. The EG had also favorable attitudes towards the instruction.

Zamani and Mohammadi (2014) conducted an investigation to discover the differences between inductive and deductive strategies in teaching grammar. The sample was selected through a general English proficiency test. The 21 students whose English proficiency score fell between one and one half standard deviations above and below the mean score were invited to participate in this study; the participants were randomly divided into two groups: 10 learners for deductive and 11 for inductive. The results of the post-test evidence that there is no difference between using an inductive or a deductive strategy in teaching grammar.

Deng and Lin (2016) conducted a qualitative and quantitative study aimed at investigating the teachers' and students' beliefs on the grammar teaching, the differences and similarities between high school English teachers' and students' perceptions toward grammar teaching, and at discovering if the English teachers' actual grammar teaching behaviors match their beliefs. The sample included 35 English teachers and 400 students from a middle school. The data was gathered using three questionnaires and one interview. The findings show that teachers believe that language teaching should focus more on meaning rather than on form. When comparing deductive and inductive way of teaching English, there is a higher percentage of teachers who prefer deductive method; meanwhile, students' grammar beliefs favor the communicative and traditional grammar focus.

The studies above reveal that there is not a consensus on which approach is more effective to teach grammar in an EFL context. The debate is still open in this respect but, if the purpose is to teach grammar using communicative methods, instructors would tend to teach grammar inductively.

#### METHOD

#### Setting and participants

This study was conducted in a public school in Ecuador where students regularly receive 5 EFL classes per week (45 minutes each class). Thirty five students enrolled in one class of the second year of senior high school participated in this study. Their ages ranged from 15 to 17 years old, and their English proficiency level varied between A1 and A2 according to the Common European Framework of Reference (CEFR). One EFL teacher imparted the lessons during this intervention, and two EFL teachers participated as observers.



### Instruments

The instruments used included an observation sheet, and a pre-test and post-test. The observation sheet was used in order to record information on different aspects related to rapport such as feelings, enthusiasm, interest, feedback, interaction, and confidence in the EFL class. The pre-test and post-test, which consisted of 25 questions each, were administered to assess the students' knowledge related to EFL grammar in terms of structures such as simple present and simple past tenses, future with *will* and *be going to*, Wh-questions, present perfect and comparatives and superlatives.

#### Procedure

The whole number of participants was randomly divided into 2 groups in order to eliminate the bias by giving all participants an equal probability of being selected as part of any group (Creswell, 2015). Before starting the intervention, the students took an EFL grammar pre-test in order to know their initial grammar knowledge. The two groups experienced different grammar teaching approaches. One group (18 students) received EFL classes in which the inductive grammar approach was used. The second group (17 students) were taught by means of the deductive grammar approach. The lessons were imparted for a period of 10 weeks and each group received a total number of 15 hours of instruction (1.5 hours per week).

In the deductive approach group, grammatical points were explained in class and students were allowed to ask questions; moreover, direct feedback was provided for learners by underlining the errors referring to the grammatical rules. The activities for teaching grammar in this group included completing handouts, writing sentences on the board in order to explain grammar patterns, reading and writing passages, and having students do exercises using the grammar structures taught.

The inductive approach group was exposed to implicit instruction of grammar. The students worked in activities, which involved them in an unconscious learning of grammar with the focus on message over abstract form. Those activities comprised watching short videos about live sports, interviews, listening to and analyzing songs, performing role plays, describing pictures, completing cloze exercises, and writing creative texts. The students under the inductive teaching condition received feedback in context through recasting rather than providing direct feedback.

In this respect, according to Richards and Schmidt (2010) language teaching methods that use the deductive approach emphasize the study of the grammatical rules of a language (e.g. the grammar translation method). In contrast, language teaching methods that apply inductive learning focus on the use rather than on presentation of the language (e.g. the direct method, communicative approach, and counselling learning).

After the intervention, students in both groups were administered a grammar post-test with the purpose of monitoring their progress in learning EFL grammar by means of the two aforementioned approaches. The pretests and post-tests were graded and the scores obtained were compared in both the experimental and control group by means of statistical procedures; in this case, t-test by using a confidence level of 95%.

During the intervention, the two EFL teachers observed the development of the lessons to determine the effectiveness of rapport in class by filling in observation sheets. Thus, in order to analyze the level of efficiency related to rapport in both groups, the results were analyzed by counting the frequencies and determining the percentages and modes.

# **RESULTS AND ANALYSIS**

After applying the t-test, the following tables and values were obtained in order to find out which approach (inductive or deductive) to teaching grammar was more effective.

In the group of students who received classes with the deductive method (see Table 1), it can be seen that there is a significant increase in the scores between the grammar pre-test and the post-test (t = 8.2395; p<0.0001).

This increase between the scores of the pre-test and post-test is also significant in the group (see Table 2) who received classes with the inductive method (t = 10.0901; p < 0.0001). This means that both groups increased their grammar knowledge.

#### Table1: Deductive approach group

Statistic	Pre-test	Post-test
Mean	3.518	5.753
SD	0.660	0.961

t = 8.2395p < 0.0001

## Table 2: Inductive approach group

Statistic	Pre-test	Post-test
Mean	3.667	6.506
SD	0.689	1.057

t = 10.0901p < 0.0001

With respect to the pre-test, the difference in scores between the deductive and inductive group was not significant (t = 0.6526; p = 0.5185) before the intervention; thus, both groups had a similar level of grammar knowledge. After the intervention a significant difference in the post-test was observed (t =2.1998; p=0.0349), which means that the inductive approach was more effective than the deductive approach when teaching grammar to these students (see Table 3).

Table 3: Results of the post-test in the deductive and inductive

Statistic	Deductive	Inductive
Mean	5.753	6.506
SD	0.961	1.057

t = 2.1998p = 0.0349

Concerning rapport, in general, the results obtained from the observation sheets indicated that rapport in the deductive approach (see Table 4) were effective (MODE = 2). In the first item, it can be seen that, in most classes (10 out of 15 classes) students were interested in the class. The results also show that the teacher was respectful and impartial in most of the classes (13 out of 15 classes). Concerning feedback, it was provided in more than half of the classes (9 classes).

In all of the classes, students were encouraged to participate, and in most of them, they interacted with the teacher and showed enthusiasm as well (10 classes). Students also feel confident when asking for explanation (12 classes).

Aspects of rapport	Slightly effective	%	Effective	%	Highly effective	%
Students are interested in the class	5	33.33%	7	46.67%	3	20%
Teacher is respectful, fair and impartial	2	13.33%	9	60%	4	26.66%
Teacher provides feedback	6	40%	7	46.67%	2	13.33%
Students are encouraged to participate in class	0	0%	11	73.33%	4	26.66%
Students interact with teacher	5	33.33%	6	40%	4	26.66%
Students show enthusiasm	5	33.33%	8	53.33%	2	13.33%
Students feel confident when asking for explanations	3	20%	9	60%	3	20%

## Table 4: Rapport in the deductive approach

As for the classes in which the inductive method was used (see Table 5), rapport was also effective (MODE = 2). In the majority of classes the results evidence that students showed interest (12 out of 15 classes), the teacher was respectful (14 classes) and feedback was provided (13 classes). Additionally, in most of the classes, students were encouraged to participate (14 classes), interacted with the teacher (12 classes), showed enthusiasm (12 classes), and felt confident when asking for explanations (13 classes).

Aspects of rapport		%	Effectiv e	%	Highly effective	%
Students are interested in the class	3	20%	8	53.33%	4	26.66%
Teacher is respectful, fair and impartial	1	6.67%	11	73.33%	3	20%
Teacher provides feedback	2	13.33%	7	46.67%	6	40%
Students are encouraged to participate in class	1	6.67%	11	73.33%	3	20%
Students interact with teacher	3	20%	8	53.33%	4	26.66%
Students show enthusiasm	3	20%	9	60%	3	20%
Students feel confident when asking for explanations	2	13.33%	12	80%	1	6.67%

#### Table 5: Rapport in the inductive approach

To sum up, it can be observed that, although both approaches to teaching grammar have been effective in terms of rapport, the percentages of effectiveness in rapport in the inductive group are slightly higher. This means that rapport was more effective in the inductive group than in the deductive one, which might be caused by a more dynamic teaching process involved in the communicative approach activities that were used as a part of the inductive method for teaching grammar.



#### CONCLUSIONS

The present study explored the difference in effectiveness between the inductive and deductive approaches as well as the effectiveness of rapport when teaching grammar in an EFL context. After the analysis and discussion of results, the following conclusions have been drawn:

Although before the intervention, both groups had a similar level of grammar knowledge that improved with the intervention, the statistical analysis shows that the inductive approach had a slight advantage in terms of improving students' grammar knowledge.

There was an effective rapport in the EFL classes in both groups. However, the rapport observed in the inductive approach group was slightly more effective, considering aspects such as the teacher being respectful, feedback being provided, students participating in class and interacting with teachers, enthusiasm, and confidence when asking for explanations in class.

Despite the fact that the present study favors the inductive approach as a more effective method to teaching EFL grammar, it is important to continue doing research on this theme in different EFL contexts, especially in Latin American countries, where this aspect has not been deeply explored.

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# **Teaching Social Sciences with a Gender Perspective: Turning Obstacles Into Opportunities Using Pbl and Fpda**

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# ABSTRACT

Today, to address the teaching of Social Sciences from a gender perspective is, more than ever, the focus of Problem-Based Learning (PBL).

In addition to theory, training competences for future teachers must be employed for a social critical analysis. It is not sufficient to offer them theoretical examples about how cultures assign gender roles as sometime these are present in our everyday lives, and are therefore difficult to change, as is our individual thought.

Using Feminist Post-Structuralist Discourse Analysis (FPDA) and the ABP on written productions of teacher training from diverse contexts (such as Colombia, Mexico and Spain), we have studied collaborative working practices, how these create their own stereotypes and therefore, how those in turn become prejudicial.

Information was collected and discussed regarding practises, and possible causes and solutions for them analysed, within their cultural context. As a result, students become more conscious of their own actions.

What obstacles have appeared? What opportunities have arisen? What good practices have emerged? How has collaborative knowledge been transferred to primary and secondary classrooms? These are the questions we want to present and discuss at this paper.

# INTRODUCTION

Today, addressing the teaching of social sciences from a gender perspective is, more than ever, the focus of a Problem-Based Learning (PBL) approach. Gender-based violence, as a socially relevant problem, appears daily in the media and in the social reality that surrounds us (economic violence; Socio-cultural violence; physical violence in the public and domestic spheres; psychological violence in the public and domestic spheres; rape, sexual harassment and sexual exploitation; trafficking of women and girls, etc.). "Gender is most often dealt with as a topic within subjects or cross-curricular themes, such as social sciences, citizenship education, ethics, history, languages or home economics" (Eurydice, 2010)

How we construct gender identities, how we approach, or not, a critical analysis of situations to accompany students in the construction of their own identity and in the meanings we give to social constructs is undoubtedly an educational challenge.

The Teaching of Social Sciences in Initial Teacher Training implies university vocational training that must be based on the construction of bridges between culture, scientific knowledge and social needs (Lessard and Tardif, 2006, cited in Santisteban, 2008), promoting the "ability to ask questions and answer" (Sternberg and Spear-Swerling, 1999: 57).

In fact, the solution to this most consensual social problem in all contexts has been, since the 1990s, education. However, despite the various educational policies emanating from both national and international institutions, the situation has not reversed (UNESCO, 2016)

What are the causes?

From my point of view, we must first address how this theme is addressed in classrooms. A report on this has been published by Eurydice (2010), whose results are still valid.

Thus, for example, if teachers' explanations are based on their own patriarchal and heterosexual construction of gender constructs, and in the activities in textbooks, we should not forget that they are made by publishers to be accepted by the majority of the population and not to create controversy. Is it possible that changes in social gender roles are explained preferentially as the traditional ones? Does the teacher have the tools to be able to contextualise situations in the context of space and time? Does critical analysis encourage or explain sociocultural elements as absolute and closed truths that cannot be questioned or have other explanations? With what ideas, perceptions and methodologies do graduates complete their degree in education in this respect? Does the teacher know how to handle open tasks and answers?



#### THE STUDY

Throughout the research process, we have analysed what the obstacles are that appear in the ideology of future teaching staff. It seems that insecurity in the face the change, the fear of the reactions in the educative context, and the lack of strategies, appear to be predominant. The power of previous ideas, traditional cultural features and experiences with the socio-cultural context have a high predictive factor that makes stereotypes and prejudices seem very stable and resistant to change (comfort zone).

But it is also true that, on many occasions, those who are going to be teachers are not aware of how they have constructed, reasoned and / or perpetuated gender realities.

The study samples that have led to these conclusions have been, on the one hand, the productions of trainee teachers, through the tasks developed in the context of Social Sciences subjects in a university of Mexico, Colombia and several in Andalusia (Spain) (Díez Bedmar, 2015), and in the final degree projects and Master's degree dissertations in education in Andalusia, accessible through the Andalusian Universities Open Access Repository (Díez Bedmar, 2017)

The open tasks of the study were performed with PBL. For this, examples were taken to the classroom to reflect the present situation in news, songs, books, announcements, or statements by public figures. Controversy arose because different perspectives and views appear, as well as interest groups (both those who emit discourses and those groups that receive them). Each of the tasks sought to foster critical thinking, research skills and a wide range of basic skills really necessary to be able to construct common meanings without imposing one or another reality. In this sense, the methodology that we had used in previous studies (Cruz Rodríguez; Díez Bedmar, 2010) based on collaborative evaluation as part of the PBL process, obtained excellent results.

To carry out this PBL with a partner-critical analysis, a Problem-Based Learning (PBL) from a gender perspective was designed, with the following steps:

- 1. To design the task
- 2. To design the tasks and overarching question
- 3. To implement
- 4. To collect students' productions
- 5. Post-test

In addition, both the open-ended productions and final degree projects and Master's degree dissertations (doing by girls (85%) and boys (15%)) were applied to the Critical Discourse Analysis (CDA) and FPDA (Feminist post-structuralist discourse analysis) Baxter methodology (2004; 2007), with the following steps:

- 1. Make a corpus
- 2. Analysis

#### RESULTS

By combining the studies that we had been carrying out, we obtained the following results.

The first of them: If, when using the PBL, we get students who participate in a reflexive way, as the post-test shows in 96.2% of cases, doing so from a gender perspective offers them the opportunity to experience for themselves how they have produced their own learning processes, and provides them with quality criteria to improve their proposals for future classroom activities, using more participatory approaches. In this way, we pass from passive students (who receive a theoretical lesson that they have to memorise without understanding), to active students who internalise and assume their responsibility.

In fact, in the post-test, they state that they have come to understand other realities, where their gender constructs come from and how, depending on these, they see in one way or another the reality and the social changes they are going to explain to their future students. Change becomes an opportunity to move forward

100% of the samples indicate, after performing tasks with this methodology, that they have perceived changes in the perception of the development of social and civic competence, both in relation to their professional and

personal future. From a quantitative point of view, the concepts most indicated in the post-test to the open question "Do you think it will be useful to use the gender perspective in the development of your profession?" are: "assume the responsibility"; "understand"; "reflect"; "use"; "act"; "change".

When the FPDA applies itself to their own productions, it is evident how they themselves created their own stereotypes and therefore, how they become their own prejudices.

Although they begin to use an inclusive language in which the will to integrate the gender identities in education, they showed how there is always the patriarchal, heteronormative, bipolar sex-gender perspective that links a gender to culturally and traditionally assigned roles, and that they interpret equality as women's claims to masculine roles, without having internalised any of the premises of equality feminism. How not work with a gender perspective as well as with differences between men and women is established, sometimes to show and to highlight them, and others in order to point out the differences. Normally, they also do so when talking about stereotypes, violence, victimisation, aggression and conflict. That is, the integration of this perspective is not normalised in the analysis of all socio-cultural, political and economic factors and features, in all educational areas.



Table 1. Key words on Final Grade Work (1-5%)

# CONCLUSIONS

The use of both methodologies (both the PBL with a gender perspective and the FPDA) turns socio-cultural and identity barriers into learning opportunities.

They help us to develop in the students civic competences without gender stereotypes, not only theoretically, but also in regard to their application and decision making about their future teaching practice and in their daily life, although we must be aware that cultural gender differences are maintained in the identity ideology, together with the need for recognition by groups.

From my point of view, one of the major contributions of the importance of using these methodologies with students is that they can test for themselves their own thinking, and what it implies in their decision making as future professionals.

Sociocultural obstacles become an opportunity for lifelong learning regarding the challenge of gender stereotypes and roles in the different past, present and future contexts, since those who leave the initial teacher training will be the real actors of the social changes that are to come, where the category of thought "gender" is present with the same relevance as others that have been used to explain (until now) the world.



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# That Made Me Think: Unpacking Reflection and Reflection-Centered Professional Development

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# ABSTRACT

While professional development is defined in different ways (professional training, faculty development, professional learning etc.) it is consistently seen as opportunities for learning, and important in education. Research agrees on this, because studies show positive outcomes and impacts such as student achievement, improved teacher instruction, and pedagogical knowledge. Research has focused mainly on what the professional development program consists of in terms of who will participate, the theory, goals, and the outcomes and impact of the program, to determine overall effectiveness. However, there is a subtle trend that shows educational researchers are no closer to determining what makes professional development effective (Hill, Beisiegel and Jacob, 2013)(Quint, 2011)(Garet, 2008)(Guskey, 2003). This narrative review suggests a shift in the focus of professional development research from the characteristics of the program, to the characteristics of the program, to the characteristics of adult learning indicates that reflection an indispensable component in adult learning (Korthagen, 2016). Therefore, if one is examining the characteristics of adults to determine their learning as a result of PD, the focus should be on reflection.

Key Words: education, professional development, adult learning, teacher learning, reflection.

## **PROFESSIONAL DEVELOPMENT**

Professional development is planned, implemented, and followed up in different ways, however it can be agreed that professional development provides opportunities for adults to learn. There are various decisions to make when planning for professional development including who will participate, what the learning will be focused around, and when the opportunities will be. These decisions often take place before implementation of a PD opportunity. Following implementation there are factors to be analyzed to determine the program effectiveness. These factors can be categorized impacts or outcomes of the PD opportunity.

#### BEFORE IMPLEMENATION: WHO, WHAT, WHEN, HOW

PD is often focused on teachers (Zwart, Korthagen, & Atterna-Noordwier, 2014) (Vermunt & Endedijk, 2011), but can include special education teachers (Doren, Flannery, Lombardi, & McGrath, 2012), special language teachers, such as English as a Second Language (ELL), subject area specialists (Drits-Esser, Gress-Newsome, & Stark, 2016), and school administrators (Quint, 2011).

The goal of a PD plan or opportunity specifies what knowledge or skills will be learned (Quint, 2011). Goals can be constructed by administrators or collectively by the participants. When determining what learning will be accomplished in a PD opportunity, teachers have voiced that they would like a more active role in the planning of professional development. This active role could contribute to establishing a community of professional learning, and potentially greater respect among colleagues (Matherson & Windle, 2017). While goals specify knowledge and skills to be learned, it has been noted that PD with fixed goals, ineffective leadership, and top down approaches can create the feeling of external pressure on the teachers (Zwart, Korthagen, & Atterna-Noordwier, 2014) (Korthagen, 2016). A study completed by Avidov-Ungar (2016) identified several official goals of PD related to the construction of teacher identities including professional commitment, collegial functioning, educational, social and moral view, and implementation of official policy (Toom, 2016). It is advised that the goals include objectives which can be measured. This will provide information as to the outcomes of the PD opportunity (Quint, 2011). Professional development goals can be subject specific, for example, analyzing student work, vocabulary, differentiated instruction (Quint, 2011), or based on a more general theory.



The theory of a PD plan or opportunity refers to what idea guides the overall design (Toom, 2016). This can be an instructional theory, based on how students learn. For example, in 2016 The National Research Council made adjustment to the science curriculum in the United States to include an inquiry- based model. This was a change in the theory of best practices for teaching science, and necessitated professional development to prepare teachers. To establish the goal of the new PD plan, teachers had to learn both the skills to teach inquiry-based science lessons, and the content knowledge of the theory itself, to understand its value. Research has found that in order to shift teaching practices, teacher PD must focus on teacher's beliefs about the value and feasibility of the new theory (inquiry-based learning) (Drits-Esser, Gress-Newsome, & Stark, 2016). In another example, a study by Consuegra et al. (2016) focused on the theory of classroom interaction, with the hope of increasing teacher awareness of implicit gender bias (Toom, 2016). In this case the goal was focused on the instructional theory of student interaction, with an additional intention for teachers to reflect on their own beliefs and values surrounding the goal.

In addition to an instructional theory for students, the design of professional development can also be based on an instructional theory for adults. For example, self-directed professional development that actively involves adults in their own learning (Malik, 2015), as in the case of Professional Learning Communities (PLCs). In this case the theory is that adults learn better in collaborative communities. In PLCs, educators meet and work collaboratively, and learn from each other to make changes in their teaching. Educators working in PLCs share common goals of improving teaching practices and academic performance of their students, and have the opportunity to direct their own learning as well as work together to achieve learning for all (Bloom & Sommo, 2005). An important aspect of a PLC is for teachers to analyze their own practice. A study of PLCs in Mathematics and Science by Kullberg et al. (2016) emphasized the importance of analysis of one's own practice as an effective way for teachers to develop professionally. PLC's have yielded positive feedback, giving evidence of the theory of collaborative adult learning. Analysis of the Opening Doors Learning Community project at Kingsboro College in Brooklyn, New York, showed that students performed better in schools with learning communities. Specifically, those in schools with the Opening Doors program achieved higher course passing rates in English, and one year after enrollment, Opening Doors students were more likely to have achieved their remedial English requirements (Bloom & Sommo, 2005). In addition to this positive feedback, it is important to also note that respect can be cultivated within a professional learning community, and teachers can even change their conception of the object of learning by participating in a theory-based learning community (Toom, 2016).

Professional development is beneficial if it offers more than a "quick fix" or "one-shot" workshops (Quint, 2011), but embraces the idea that professional growth, an effect of PD, is a progression that takes time (Matherson & Windle). This would include several opportunities defined as either workshops or seminars, with follow up (Quint, 2011). Professional Development that occurs over a span of a year or more, or many hours can have positive effects such as changes in beliefs or practices (Drits-Esser, Gress-Newsome, & Stark, 2016). However, many institutions do not have funding or resources to sustain long-term PD, highlighting the need for institutional support (Guskey, 2000). A solution to offering more intensive PD is to have a summer institute of several all-day opportunities.

In the United States, a national study of state and local No Child Left Behind (NCLB) implementation reported that 80% of teachers were receiving 24 hours or less of professional development specifically on reading instruction (Garet, 2008). Reading experts are concerned that this is not enough for the PD to be effective. As recommended, if PD is organized into several opportunities, it can be considered a PD plan.

When Evans asked the question in 2014, "How does one develop professionally?" The discussion changed from what is done, to how it can be achieved (Matherson & Windle, 2017). Within the workshops and seminars, there should be activities planned with different delivery methods. Extensive literature on science-based professional development indicates that PD activities should include three critical elements: long term engagement, collaboration with other teachers, and emphasis on student learning (Drits-Esser, Gress-Newsome, & Stark, 2016). The creation of a professional development plan must have scaffold activities for participants know exactly what is expected of them (Gordinier, 2006).

PD Activities are considered learning activities when they lead to a change in behavior or cognition (Hoekstra, Beijaard, Brekelmans, & Korthagen, 2009). As activities do not always require physical activity, they can be divided into two levels, action and mental. An activity on the action level might be collaboration, whereas an activity on the mental level could be analyzing and memorizing. Since the discussion surrounds professionals learning, the activities are focused on how adults learn best. Analysis of activities for adult learning generated four categories:

# **Categories of Informal Learning Activities**

Learning by experimenting		
Learning by considering own teaching practice		
Learning by getting ideas from others		
Learning by doing		

(Hoekstra, Beijaard, Brekelmans, & Korthagen, 2009)

All of the above activities can take place either individually or collaboratively. The first category refers to trying out new instructional methods, such as new assignments or behaviors. The second involves individual or collaborative reflection. The third refers to utilizing resources, either interaction with others or the internet or articles. The fourth is less clearly defined, as it includes incidental learning, unplanned activities, or learning that the teacher is unaware of (Hoekstra, Beijaard, Brekelmans, & Korthagen, 2009). In order to bring awareness of learning in the "Learning by doing" categories, teachers must engage in critical reflection to identify possible learning while teaching. An additional publication (Meirink, Meijer, Verloop, & Bergen, 2009) cites that Hoekstra's categories can be further divided. For example, experimentation can be subdivided into experimentation with an adapted strategy from a colleague, or experimentation with a copied strategy. The categories of learning activities provide a framework for what types of activities should be included.

Since learning can occur formally or informally, learning activities for teachers can also be covert or overt (Vermunt & Endedijk, 2011). Overt or observable learning activities are rarely witnessed in an informal setting, such as reading or exchanging ideas. In formal professional learning activities, Kwakman (2003) developed four additional categories of activities: reading, experimenting, reflecting, and cooperating.

Professional development opportunities have different delivery methods, including lectures, discussions, creating portfolios, and instruction modeling. Teachers indicate that the most useful delivery methods active participation and hands-on activities, rather than abstract discussions (Matherson & Windle, 2017) (Garet, 2008). This can be summarized as social interaction. Some practitioners and program developers maintain that knowledge teachers obtain in PD workshops or seminars should be periodically reinforced through coaching (Quint, 2011). Guidelines in the 2007 standards for professional development in the field of pharmaceutical care education highlight the importance of academic counseling and advising (Zueger, Katz, & Popovich, 2014). The focus on faculty involvement arose from an observed failure at the University to adequately address professional development. However, there is also evidence that coaching can be costly and time consuming, and there is little rigorous evidence about effectiveness (Quint, 2011).

In addition, current trends in professional development include virtual settings as a delivery method that employ electronically based courses, discussions and portfolio requirements (Killham, Tyler, S. P., Venable, & Raider-Roth, 2014). Virtual professional development helps professionals adapt to a technology-dominated workplace, and require teachers to take an active role (Hawkes & Romiszowski, 2001). Virtual professional development may also allow for further standardization or community-building among disparate members of an academic community. The virtual environment provides methods for follow-up and feedback, as it builds for immediate communication with colleagues and supervisors into its framework (Parkes & Kajder, 2010).



## AFTER IMPLEMENTATAION: OUTCOMES, IMPACT, EFFECTIVENESS

Professional development is designed and implemented with the expectation that teachers will learn, and the goal will be met. In order to determine if the goal is met, or to what degree, one must look at the outcomes, impact, or effectiveness or the PD plan or opportunity.

An outcome of PD is an immediate result, such as teacher learning. Outcomes are predefined, and can be measured. An impact refers to a broader or longer term result. An impact of PD could be student achievement. Both outcomes and impact contribute to overall effectiveness, the broadest of the three terms. Evidence of effectiveness could be professional growth, community development or increased respect among colleagues. PD evaluations generally include systematic collection and analysis of data to measure PD outcomes and impact, to help determine the overall effectiveness.

Several methods have been developed to evaluate the outcomes and impact of the professional development plans, in the hopes of determining overall effectiveness. The more outcomes and impacts are assessed and compared, the better the effectiveness can be determined. Large scale studies on models of professional development such as Garet (2001) rely on core structural components of the plan as variables for data collection. These components are then assessed and documented to evaluate improvement, an increase, an enhancement, or the impact (Garet, 2001) as cited in (Penuel, Fishman, Yamaguchi, & Gallagher, 2007). Different methods for evaluating professional development programs include models developed by Stake, Scriven, Kirkpatrick, Stufflebeam, and Guskey (Newman, 2010). Stake's method focuses mainly on teacher and student evaluation, particularly on standardized testing (Stake, 2000). Scriven further explains the new discipline of professional development evaluation. He develops the Pathway Comparison Model, comprised of nine steps: characterizing the program, evaluating cause and effect relationships, identifying goals, and analyzing the programs critical competitors (Scriven, 1998). Kirkpatrick moves away from a strictly empirical model, outlining four steps for professional development evaluation including reactions (how participants feel), learning (what participants learned), the trainee's performance, and results (Kirkpatrick, 1998). Stuffelbeam takes a constructive approach, placing emphasis on institutional gain (Stuffelbeam, 2000). Finally, Guskey's model uses five primary components including satisfaction, learning, changes in practice, administrative support, and student performance, essentially expanding on Kirkpatrick's model (Kreider & Bouffard, 2005/2006). David Newman's doctoral thesis provides empirical data that validates Guskey's model through six years of student and teacher reading data (Newman, 2010).

While professional development models focusing on the above categories can give a relatively sound understanding of the overall effectiveness, it is advised by Toom (2016) that the teacher's own understanding of their progress is examined. Teacher's own beliefs and approaches have proven to be important factors in their learning (Toom, 2016).

#### LEARNING ACHIEVEMENT AS AN OUTCOME

Learning outcomes according to Hoekstra (2009) are changes in cognition or behavior resulting from engagement in activities. Cognition refers to teacher's conceptions of teaching and learning, and behavior is considered action that stimulates student's active and self-regulated learning. In addition to being pre-defined, learning outcomes should be measurable. In the case of Hoeskstra (2009) teacher behavior was measured through a student questionnaire, and teacher's conceptions were measured using a self-administered, scaled questionnaire.

James (2009) proposes that once one learns *how to learn*, learning autonomy can be achieved as an outcome. Bakkenes (2010) determined that there are four types of learning outcomes: (1) changes in knowledge and beliefs, (2) intentions for practice (3) changes in actual teaching practices in a more permanent way (4) changes in emotions. Eraut (2004) discerned a broader typology of domains for learning outcomes: (1) task performance, (2) awareness and understanding, (3) personal development, (4) teamwork, (5) role performance, (6) academic knowledge and skills, (7) decision making and problem solving, and (8) judgment.



Research funded by the U.S. Department of Education implemented a PD intervention to determine the impact on student achievement. The first step in determining the impact on student achievement was to give the teachers who participated in the PD intervention a knowledge test (Garet, 2008). Teacher knowledge was measured as an outcome of PD before the impact in terms of student scores, providing data to help answer the overall question of the effectiveness of the PD intervention. Some studies, like Kullberg et al (2016) focus exclusively on the outcomes without determining impact, for example the outcome of how teachers handle their own learning without the impact of these changes on student learning (Toom, 2016).

## WHAT IS MISSING?

There are several important deficits in the discussion thus far of professional development. First, Toom (2016) suggests that the teacher's own understanding of their progress is examined, not only the program. Secondly, it is noted by Korthagen (2016) that in order to really measure PD impacts, the person or teacher should have a central part in integrating theory and practice. Quint (2011) calls for a new measure of the impact of PD, stating that causal relationships are difficult to determine with existing methods. Perhaps there is something missing in the process of planning, implementing and evaluating professional development. As stated by Matherson & Windle (2017), "In a 2009 study, Darling-Hammond, Wei, Andree, Richardson, and Orphanos found that 90% of U.S. teachers participated in these types of sessions, which had little to no impact on teacher pedagogical practice or student learning" (Matherson & Windle, 2017).

It can be said that professional "always matters and always makes a change" (Toom, 2016), however, current empirical research on professional development hints that the education community is no closer to determining what makes teachers develop professionally. While evaluations can determine that there are positive outcomes and impacts leading to effectiveness, these results are not statistically reliable when used to make future predictions about effectiveness. In 2003, Guskey completed a comprehensive review of thirteen different lists of characteristics of professional development, and then created his own list of most common characteristics (Campbell, 2008). In this process he found that there is no consensus of successful characteristics of professional development. For the purpose of understanding current professional development research, Hill, Beisiegel, & Jacob (2013) completed random trials of PD programs, reaching the conclusion that we have not enhanced our knowledge of effective program characteristics. In 2011, Janet Quint studied PD interventions in reading, to discover that results were less positive than hoped for, noting that some instructional practices were affected and not others. Michael Garet conducted a similar experimental study, also to determine the impact of PD interventions in 2008, finding that there was no immediate impact on student achievement, and there were no statistically significant impacts on measured teacher or student outcomes in the following year.

In order to improve effectiveness of PD, it is suggested that one takes a broader conception of teacher learning, with emphasis on learning and characteristics of learners (Quint, 2011). Building on Fellenz and Conti's (1989) suggestion that the learner could be the basic organizational unit, it is proposed that instead of looking at the program as the unit of measure, the participants could be the unit of measure, changing variables to be studied from the characteristics of the program to the characteristics of the person and how they learn.

Teachers often reject innovations presented to them by educational experts or other teachers (Elliot, 1991), and as a result show resistance, tension, and emotional exhaustion (Korthagen, 2016). Teacher development programs should therefore focus more on teacher's characteristics, to find ways to support learning that are fulfilling and effective. These characteristics, defined as core qualities in Korthegan's Onion Model (2004), refer to character strengths that people possess. Since these qualities are driving forces in people's thinking, feeling and acting, they are also linked to learning (Zwart, Korthagen, & Atterna-Noordwier, 2014). The layers of the Onion Model if developed independently of each other, or without relatedness, will cause unrest and potential stress (Korthagen, 2004). In order to relate the layers together the individual must engage in reflection, which will increase overall awareness, develop trust, autonomy, and identifying obstacles (Zwart, Korthagen, & Atterna-Noordwier, 2014).

Korthegan's Onion Model ties in with Knowles' theory of Andragogy, that learning as an adult (unlike learning as a child) requires certain attributes. No matter the title, goals, facilitation, characteristics, or objectives of the learning opportunity, it could be that a specific nature contributes to learning. Simply, effectiveness be predicted based on characteristics of the PD program alone.

Focusing on the individual participant in PD rather than just the program is similarly justified through discussions of how adults learn effectively. Malcom Knowles, the founder of the concept of Andragogy wrote a retrospective in 1979 of the professional development trends he witnessed since his involvement in the field. Classified by decade, he described the changes in activities and characteristics of programs with varied impacts. He concluded that if the learner continues to develop, professional development will be effective, cautioning researchers not to commit to "fads" of training models, but to the underlying theory of Andragogy. With a focus on individual learning the program, regardless of 'fads', will be respectable (Knowles, 1979). A further exploration of Knowles' theory by Fellenz and Conti (1989) mentions that the uniqueness of the individual, including their traits, should be considered in a discussion of adult learning.

If the characteristics of the individual and how they learn are not examined, the field risks continuing to go in circles, with lengthier and more elaborate investigations examining every aspect of the program instead of the person. In a narrative review of current outcomes of professional development, Toom (2016) cites the value of studies that took the individual into account in addition to the program as more valuable in the research community. Toom (2016) concludes with a call to action for professional development scholars to think more broadly and creatively, to make significant progress to determine how exactly adults learn. Now that it has been established that professional development research should include a focus on the individual and how they learn, it is necessary to transition to a discussion of adult learning.

# ADULT LEARNERS

A new wave of literature (Korthagen, 2016) suggests that the discussion of how teachers learn should frame our thinking about professional development. Educational researcher J. Roby Kidd (1983) predicted an important paradigm shift in his exciting realization that the focus of his field had changed from adult education to adult learning, a new field of study (Fellenz & Conti, 1989). The field of cognitive psychology also influences work in adult learning (Fellenz & Conti, 1989). Conceptions of intelligence are moving away from simply IQ towards other characteristics of the individual, requiring understand of learning styles (traits) and learning strategies (techniques to accomplish a learning task).

Learning is defined by the Oxford English Dictionary as "the acquisition of knowledge or skills through experience, study, or being taught". Twentieth-Century academics have acknowledged the difference between learning as a child and learning as an adult, and have added to the definition of learning to cater to the specific needs of adults. Mezirow begins the discussion of adult learning with a review of Habermas's theory of learning. Habermas characterizes the learning domain as emancipatory, involving self-awareness (defined as knowledge of self-reflection), essentially freeing the individual from institutional and environmental factors. This allows insight to be gained and one can recognize the 'correct' reasons for one's problems (Mezirow, 1981). Some recognize this emancipation as synonymous with perspective transformation, referring the assumption that (like Merleau-Ponty's embodied experience) new perspective is assimilated with and transformed by one's past experience. Perspective transformation fills a gap in adult learning theory by acknowledging critical reflection. Mezerow differentiates between three domains of learning: instrumental, dialogic and self-reflective. He posits that the distinguishing characteristics of adult learning is developing an awareness of why we attach the meanings we do to reality (Mezirow, 1981). As an adult one is able to posit about different paradigms. As the three domains of learning cannot be easily separated in a given situation, Mezirow supports the use of a phenomenological study to understand the adult learning process. For the purpose of this study, adult learning will be defined as the learner (an embodied whole) acquiring new knowledge and skills (Mezirow, 1981).



#### ADULT LEARNING THEORY

Merleau-Ponty rejects both empiricism and intellectualism, both for their atomistic approach to sensory experiences. Ponty focuses on the meaningful whole as a perceptual experience, rather than in terms of cause and effect (Merleau-Ponty & Smith, 1962, 2003).

Maurice Merleau-Ponty in The Phenomenology of Perception (1962) uses the example of perception to define the embodied experience. In his discussion of Other Selves he reminds us that we tend to think of our present selves as central and in terms of which we can explain our past lives. For example, what I learn today brings me closer to understanding the significance in terms of my life as a whole. But this is only part of the discussion of past experiences. When aspects of the lived experience are first encountered, they contain their own novelty, meaning they might have best been understood when first experiencing them. Since memory might fail to reconstruct this novelty as it was experienced, the individual is never quite "at one" (Merleau-Ponty & Smith, 1962, 2003). Merleau-Ponty's criticism of educational theory of Piaget is that he views adults as too rational and without contradiction. Piaget uses adult awareness to uncover objective truth, which can then be used to defend a child's outlook. Merleau-Ponty suggests that the childhood experience carries into adulthood. Essentially, early existence (past) also stands at the core of one's personal life. The body as a singular entity is inhabited by both simultaneously.

Rooting the embodied experience in a teaching context, educators often think after a lesson goes poorly "I will change it for next time by...". This skips the critical reflection phase in which a deep awareness of the essence of the problem is established. Deep awareness is established through a reflection by including the dimensions of thinking, feeling, wanting, and acting (Korthagen, 2016). By analyzing discrepancies in the answers to these questions, the practitioner might then change the action for next time.

Recent research in adult learning has shown an increased use of a phenomenological approach, or acknowledgement of the lived or embodied experience. For example, a study by Jamie Huff Sisson (2016) emphasizes the significance of teacher's lived experiences in influencing professional identity, while a study by Akdag et al. (2016) used a phenomenological approach to analyze early-teacher's classroom management concerns. Similarly, there is a growing discussion in adult education regarding the body as a site for learning (Tobin & Tisdell, 2015). Embodied learning can be defined as a holistic view of constructing knowledge that engages the body as a site for learning (Freiler, 2008 as cited by Tobin & Tisdell, 2015). According to this definition, the body is not just a site for learning, but is the center of analysis. In the context of adult learning, connecting the "Felt sense" to reflection, as the it demands words and actions. This is most clearly demonstrated in Sodhi and Cohen's work (2012) studying how social workers trusted their somatic or embodied sensations to guide their practice.

Merleau Ponty focuses on the body's role as a pre-reflective vehicle that gives rise to perception. Essentially, the body is the knower of the world or the pre-reflexive actor, and reflection is the oral, written, or artistic expression of what the body has perceived (Tobin & Tisdell, 2015). As such, all expressions are products of the body, but also holistic.

In John Dewey's Experience and Education, (1953) after a discussion of traditional versus progressive education, he concludes that neither are effective without a theory of experience. Experience is built on two ideas: continuity and interaction. Continuity (or the experiential continuum) points out that past experiences are part of future experiences, which can have both positive and negative results. Interaction indicates the influence of the situation on an experience. Simply, a learning experience is partly the current circumstance (the activity, the way the lesson is presented), but also partly based on the past experience of the learner. The two theories of continuity and interaction are not separate from one another. A learning opportunity means that "what he has learned in the way of knowledge and skills in one situation becomes an instrument of understanding and dealing effectively with the situations which follow" (p. 44). Throughout the text, Dewey maintains emphasis on the idea that for learning to occur the past experiences of the learner must be taken into account. This will allow the learner to reach their full potential.



When considering the idea of teaching teachers, it is important to distinguish between formal and informal environment. Pre-service teachers are often being taught in a formal environment, defined as a clear facilitation of learning (Hoekstra, Beijaard, Brekelmans, & Korthagen, 2009). In-service teachers are often taught in an informal environment, defined as learning in the workplace where systematic support of learning is absent.

Malcom Knowles compiled theories related to teaching adults and named it the Theory of Andragogy. They theory is based around the idea of self-direction, differentiating the term from Pedagogy. Self-directed learning is defined as: "learning situation in which learners take the initiative in diagnosing their own learning needs, in formulating learning objectives, in locating resources to fulfill objectives, in carrying out a learning plan, and in evaluating the extent to which they met objectives" (p.38) (Hatcher, 1997). The main traits of the Theory of Andragogy rely on the idea that humans have a psychological need to be self-directed, they bring into any learning situations, resources from their previous experiences, they are task and problem centered, and in the right circumstances, are intrinsically motivated to learn (Knowles M., 1980).

# **REFLECTION IN THE CENTER**

In the discussion of adult learning, Habermas mentioned the importance of reflection in his definition of selfawareness, an essential component of adult learning, and that critical reflection fills a gap in adult learning theory. Merleau-Ponty highlights the value of critical reflection as the awareness of the essence of a problem in the embodied experience or reflection is the oral, written, or artistic expression of what the body has perceived, which Korthagen (2016) further defines through his line of questions to establish awareness. Dewey recognized reflection as the bridge between what the individual is learning and past experience in his holistic approach. For Knowles, in order to be a self-directed learner, one must be reflective. As summarized by Korthagen (2016) reflection an indispensable component in adult learning. Therefore, if one is examining the characteristics of adults to determine their learning as an outcome of PD, the focus should be on reflection.

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# The Analysis of the Acquisition of Written Chinese by Polish Student Beginners

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## ABSTRACT

Learning Chinese, comparing to other languages, especially Indo-European languages, requires individual approach. The specificity of Chinese written system makes all the notorious means of learning languages useless to certain extend. In this article the aspect of Chinese writing system acquisition by Polish student beginners will be examined.

At first, the specificity of the Chinese written system will be introduced, followed by a set of examples on its diversity and its implications on the further analysis. Then, the learning methods used in learning Chinese written system will be examined. The final part of the article will be devoted to the critical analysis of the students' progress and final remarks on students' learning strategies and their effectiveness in learning Chinese written system.

# INTRODUCTION

Comparing to Indo-European speaking nations, Chinese are probably one of the few nations which still use an alphabet resembling their ancient writing style, which has been used for over 5000 years in the Far East. Obviously it has undergone numerous changes in its shape, style and writing system, however it still retains a close resemblance to the original written system, especially in terms of pictograms, and photographic icons of the ancient characters. Also, the specificity of the Chinese written system, namely the stroke order and the stroke shapes are still crucial for the Chinese native speakers, treated by them as their orthography system (Zhou J. 1998; Sun, Sun, Ch., 2006).

#### FOCUS OF THE STUDY

The main focus of the study was a three months continuous assessment of the acquisition of Chinese characters and phonetic alphabet, called pinyin in two class environments, namely in teenagers study group and adults study group. In regard to writing, the author investigated the stroke order, character recognition, character acquisition, and how the specificity of Chinese influenced the learning process. Also, she focused on the process of association of the pinyin equivalents and their correspondence to the characters (hanzi) and the learning difficulties it brought to the students of both groups during their learning process.

# **RESEARCH PARTICIPANTS**

As mentioned above, the study was conducted on two age groups, namely: teenagers and adults. As can be seen below (Table 1), the group of teenagers' age varied in between 16 and 19. There were 12 students attending the classes observed during the study, 4 male students and 8 female students. They were all high school students. The adult group, on the other hand, consisted of 18 students (10 female students and 8 male students) in the age of 20 and more. The majority of the students (12) were university students, the other 6 students were workers of various companies mostly dealing with foreign trade and economy branches.

Research Sample	Age	Background	Amount of students
Teenagers	16-19	<ul><li>No previous Chinese experience</li><li>High school students</li></ul>	12
Adults	20 and over	<ul><li>No previous Chinese experience</li><li>Workers/ university students</li></ul>	18

Table 1.Research Sample Introduction

Both of the research groups were of Polish origin and none of the students of both groups had any previous experience with learning Chinese.

# **RESEARCH METHODS AND TOOLS**

The corpus of this case study was collected by means of numerous tools and instruments, namely, questionnaires on perception of Chinese written systems (pinyin and hanzi), class observations, open discussion in class (oral group interviews and individual discussions) and language tests to assess the participants' progress in various areas of Chinese competence (short written tests, dictations, translation tests, etc.). The research lasted for three months.



#### THE SPECIFICITY OF THE CHINESE WRITTEN SYSTEM

It is said that Chinese has not more than 400 syllables. Unfortunately, hence Chinese is a tonal language each of these syllables may (with some exceptions) occur in 4 (or even 5) different tones, and each phonetic representation may have an individual character representation (usually more than five, up to even 20 distinct translations), creating a vast number of words in the written form, although Chinese has only 26 letters in the alphabet (Kostrzębska, K. 2007:6).

As was mentioned above, Chinese consists of the written characters called 'hanzi' and their alphabetical equivalents called 'pinyin' with their corresponding tones called 'shengdiao' (Sun, Chaofen. 2006:1-3). It is a syllabic language, thus as opposed to other languages, there are only few words which consist of only one letter, such as onomatopoeic sounds or interjections like a for instance sound of surprise '啊!' or '哦!'.

Syllable	Tone	Character representation	Translation
		representation	
	māo	猫	A cat
MAO	máo	毛	hair / feather / down / wool / mildew / mold / coarse or semifinished / young / raw / careless / unthinking / nervous / scared / (of currency) to devalue or depreciate / classifier for Chinese fractional monetary unit
	măo	泖	still water
	mào	帽	A hat/ cap

Table 2. Chinese phonetic and written representation of one syllable and its meaning

For the further reference in terms of phonetics of Chinese see: Chao, Y. R. (1930), Yip, Moira. (1980), Shen, Norman, J.L. (1988), Xiao-Nan.(1989). Qian, Kan. (1996), Sun, Ch. (2006)., Branner, D. (2006), San, Duan-mu. (2007), and also: Sun, Ch. (2006).

What makes Chinese unique, as opposed to any Indo-European language, when learning Chinese one has to learn five various elements at the same time:

- the phonetic equivalents 'pinyin' (syllabic or multisyllabic words),
- their tonal representation
- the meaning,
- the characters,
- and their stroke order

Stroke's	Visual representation	Example	Explanation of the writing system
name			
竖折 shùzhé		医	The horizontal stroke with a downward turn is written first from left to right and then downward.
横 折 钩 héngzhé gōu		喝	The horizontal stroke with a downward turn and hook is written first from left to right, then downward, and finally a turn is made toward the top-left by quickly lifting the pen to make the hook.

Table 3. Chinese writing system – a sample of strokes and their writing explanations (based on: Sun, Chaofen, (2006): 107-109; (I-1); Yang Jizhou, 2006)

Table 3 presents two out of twelve distinct stroke shapes necessary to master in the learning process. The above mentioned aspects make the learning process significantly more complex and challenging. The specificity of Chinese is even more complex than the above mentioned examples. Stroke shape and count may influence the meaning of the character
Stroke shape influencing the meaning		Stroke count influencing the meaning		
土 'earth, ground'	± 'bachelor'	日 'day'	目 'eye'	
天 'sky'	夫 'husband'	大'big'	太 'too much'	
见 'to see'	贝 'selfish'	工 'work'	王 'king'	

(Table 4).

Table 4. Stroke shape and count influencing the meaning of the character

Above are only few out of hundreds of examples of such words that are very similar in their visual representation, however their detailed analysis shows that even one false stroke shape or inappropriate length, etc. may end up in writing an entirely different character. For instance the character ' $\pm$ ' that means 'earth, ground' and the character ' $\pm$ ' which means 'bachelor' although very similar in general, however, entirely different. The difference is in the length of the base stroke (the last stroke written in both characters) in the lowest part of the character. In the first example it is significantly longer than in the second character, not to mention that their meaning is entirely diverse.

As proven above, the Chinese written system is unique and challenging in terms of learning. Below there is the analysis of the two groups in question and their Chinese written system acquisition.

## THE STUDY

Before the study itself, the author have conducted a questionnaire verifying students' motivation and attitude towards learning.



Figure 1. Motivation in learning Chinese written system by teenagers and adults.

As can be seen in the figure 1 above, there is a significant difference between the motivational factors of the research groups in question. 55% of teenagers claim that their motivation is instrumental and learning Chinese will help them finding well-paid jobs, however, 45% of the group claim that they learn Chinese out of personal interest in the language and Chinese culture. There is a significant difference in terms of the results of adults motivation attitude, namely the majority of adult students claim that their motivation is purely instrumental (80%) and claim that learning Chinese will secure their future, however only 20% claim that they learn Chinese solely out of their personal interest.

The author also examined the teachers' teaching methods used in class. The teaching approach and method during classes was eclectic in form, in the following proportion:

- Student-oriented teaching (active learning, students solve problems, answer questions, formulate questions of their own, discuss, explain, brainstorm during class) 40%
- teacher-centered and content focused teaching 10%.
- Interactive/participative teaching and direct method (student-centered method) 20%
- Grammar- translation teaching (teacher-centered method) 30%



Students were active in class, the relationship between the lecturer and the students was positive, the instructions were clear and direct, the students received positive feedback from the teacher.

It is interesting, how various people see characters, children see them as: 'pictures, paintings, etc.' however it seems that with age the visual introduction tends to narrow down to 'a group of strokes arranged in a certain way'. Both groups of the study created a very good system of memorizing characters by means of association and collocation. Research shows that the reasons for choosing the above mentioned strategies included the fact that *hanzi* was often perceived by the students as pictographic images or symbols with distinct meanings and pronunciations difficult to comprehend and learn separately. Thus their visual association of particular characters with the meaning or with other similar *hanzi* characters often facilitated the students' learning process.

Chinese characters were indeed pictograms, thus seeing them as pictures really helps in the learning process (Mc Naughton, W. and Li Ying. 1999:10-15).

Character	Teenagers- Students (16-19)	Adults (20 and more)			
Traditional association technique					
'one'	One stick	One stick			
二 - 'two'	two sticks	two sticks			
$\Xi$ - 'three'	three sticks	three sticks			
人 - 'human'	A headless human being	A headless human being			
口 - 'mouth'	Mouth	Mouth			
女 - 'female'	A female	A female			
Visual collocations technique					
四 - 'four'	Geometrical shape	Football field			
六 - 'six'	A human being with a head	A human being with a head			
书 - ' book'	An open book	A set of books			
厨房 - 'kitchen'	A human in the kitchen stirring something in the pot put on a stove	-			
说 - 'to speak'	A tv with an antenna	A tv			

Table 6. Chinese characters' graphic interpretation

The study showed that, as can be seen in the table 6, there were two main ways of associating the characters by the students, namely by means of the traditional association technique and visual collocations. There were certain similarities in both groups' perception of the characters, however there were also noticeable differences. The traditional association technique turned out to facilitate each groups learning process identically. For all of the students the pictograms of numbers 1,2,3 and the words 'human', 'mouth' and 'female' were the same and corresponded to the characters meanings. However, the analysis of the visual collocations technique shows more diverse results. As can be seen, the number 'four' was not associated with the number '4', but with two diverse collocations. The teenagers saw the word in question as a geometrical shape of a large square with a shape corresponding to a 90 degree angle in its left top corner and a square in the right top corner, however, the adults saw a football field instead. None of the associations was even remotely close to the meaning of the word. In order to connect the word with the meaning, the students of both groups created stories including the association of the character's shape and the meaning, e.g.

四 - The **square** has got **four** sides (teenagers).

四 - The **football field** has got **4** corners. (adults)

Similar situation occurred in the case of the word 'six' and 'to speak', however both groups of students had simmilar associations of the meaning to the characters' shape, namely:

 $\dot{n}$  - six people spread their arms and legs and turned their heads right. (teenagers and adults)

说 - there is an interesting **talkshow** on the **tv** (teenagers and adults)

The significant difference could be observed in terms of more complex characters, e.g. ' $\mathbb{B}$ ' from the word 'kitchen'. The adults had problems to find a visual collocation, whereas the teenagers have instantly provided a visual association of: 'a person in the kitchen stirring something in the pot put on a stove'. The teenagers were more open-minded about the association technique than the adults, thus it proved to be more effective in their case.

The collected data analysis (second and final questionnaire conducted in the end of the research) showed that the students underwent a change in their perception of their learning process. Initially, the tones turned out to be the most difficult element for them. The reason for this seems to be the specificity of Chinese characters which were new to the students, which led them to devote most of their time to learning this distinct writing system of hanzi and the stroke order. At the same time, due to the appearance of the Latin script based alphabet of pinyin, the students devoted less time to the tonal and pinyin acquisition.

All in all, the cognitive strategy of association enabled all the students to connect the newly acquired *hanzi* with the old ones by memorizing. They then overcame their limitations regarding speaking and writing so they could cover more material in significantly less time. The indirect meta-cognitive strategy helped students evaluate their results by self-testing. The affective strategy, in question, influenced the students' motivation by improving their learning efficiency. The final data collected in the end of the research showed that he students in the teenage group have learned 10 distinct characters a week, resulting in acquiring knowledge of approximately 120 characters, whereas the adults learned 20 characters a week, resulting in their acquisition of 240 characters within the research period.

#### FINDINGS

In the previous chapters, the detailed analysis of the specificity of the Chinese language and its writing system was introduced, explaining the difficulties which students have to undergo in the learning process. What is more, the research concerning two groups of students was performed, resulting in establishing the Chinese characters association system. The results were followed with a summary of the amount of acknowledged, learned characters by both age group.

Although, there was a lack of language environment outside the classroom, the change in language competence could be seen in the last stage of the characters' learning process resulting also in the emotional impact on the students making them respect the language more, and tending to spot more details in terms of stroke order, stroke shape, etc.

After the research, it is fair to say that learning Chinese is a struggle, especially in terms of writing Chinese characters. It is a continuing process of doubting one's abilities and talents. Fortunately, due to their persistence in striving for educational success, and their inner motivation, they succeeded in learning a satisfactory amount of characters, what brings them one step closer to the final success resulting in fluent communication in Chinese.

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## The CBLT in Algeria: Prospects and Perspectives

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### ABSTRACT

This presentation draws a general picture of today's time-based educational system in Algeria with the teaching of English as a Foreign Language as a case in point. We shall then expose the pros and cons for the implementation of the CBLT in Algeria. A number of classroom observations and empirical results will be given as markers of school failure in Algeria today. The system under study lacks in fact the opportunity and the adequate environment for the acquired knowledge to become dynamic rather than static. A time-based system as expounded in our schools and universities remains inadequate for such an achievement. The answer would rather be teaching and training based on competencies. An adequately implemented Competency Based Approach to Language Teaching (CBLT) is a possible avenue of exploration for a more appropriate ELF/EFL learning and teaching in Algeria.

Key words: time-based educational system, school failure, Algeria, dynamic vs. static learning, CBLT.

Despite a growing tendency in Algeria among syllabus designers, textbook writers, teachers, university lecturers and other actors in the Algerian educational sector, and a de facto recognition amongst higher level decision makers that changes must be brought

urgently<sup>1</sup>, together with the most recent debates on schooling and education, the current educational system in Algeria remains essentially based on courses scheduled to last for a given period of instruction (School / University). This means that learners in various fields of study like Maths, Physics, or languages are involved in courses that supposedly -and erroneously- prepare them for a profession that will integrate them as white collar staff in the Algerian economic and social spheres.

If one takes the case of English for illustration, progress in these school courses is time-based (1<sup>st</sup> year English, 2<sup>nd</sup> year English, 4<sup>th</sup> year English, etc.). This means that during this learning phase, the teacher is supposed to have given an amount of knowledge and reached a particular stage in the textbook or the course content. This in turn entails that the learner is supposed to have learnt at the pace "imposed" by the teacher, the text-book, or the course itself. Yet, we know today that not all learners learn at the same pace, nor is the teacher's output necessarily the same as the learner's input (Krashen, 1995). Tests are scheduled on a periodic basis to determine the input of the learner and scores are compared to check his/her progress in the course. In case of failure, some remedial work is sometimes conducted, but it has never been based on the individual. The failing student rarely obtains individual assistance unless he resorts to private courses outside the school or the university and provided the parents or else are prepared to pay for the course in private institutions.

The typical effects and affects of a time-based teaching programme in the Algerian educational sector today are clearly shown in the rates of success during the upgrading from one school or university level to another and more particularly in the O level and A level exams results (BEM, Baccalaureate, etc.) which are published each year and which are indicative of school failure and of the inadequacy of the teaching / learning policies in Algeria.

Time-based teaching has proven successful at times over the years and in specific teaching environments (sandwich courses, crash courses, etc.). Nevertheless, such approaches to education have also proven to be inadequate if the

<sup>&</sup>lt;sup>1</sup> . Cf. the successive ministerial instructions in this vein, the different committees of programs and syllabus designers and experts, TV and radio debates, speeches and recommendations, the documents published by under the banner of the National Education Reform in Algeria, etc.

course objective is to lead the learner to perform a number of tasks on the basis of the knowledge he has acquired during the learning phase. A point in case would be our 'Licence d'Enseignement de Langues'<sup>2</sup> which has produced over the years teachers who have been poorly prepared for *teaching* (rather than for the teaching profession) mainly because the programmes, knowledge and training given in our universities are inadequately designed for performing the task of a teacher of a foreign language. Similarly, the school learner knows basically how to perform an addition, a multiplication, a subtraction or a division in class, but he fails to apply this knowledge in real everyday situations simply because he has been trained and used to 'return back' what he learnt in the classroom during an assessment, a test or an exam scheduled during the school year. This entails that knowledge is such cases remains confined to the classroom environment and for evaluation purposes both for the teacher, the learner, and the school institution.

What lacks in the case of the teacher and that of the learner is the opportunity - or at least the adequate environment-, where the acquired knowledge becomes dynamic rather than static. The learner needs to put to work the acquired knowledge in terms of skills and capacities, to be able to re-invest it during the performance of a task and to call upon his/her individual strategies as breakdown strategies in problem solving situations, among other things. The learner needs to develop a new behaviour in class as well as outside class, and most of all he/she needs to be guided to develop the feeling of having achieved something on the basis of what was learnt.

No doubt, a time-based educational system as expounded in our schools and universities is not appropriate for such an achievement. The answer would rather be teaching and training based on competencies that are acquired during teaching, learning and practice. This new vision of teaching has come to be called a Competency Based Approach (henceforth, CBA) and extended to the Competency Based Language Teaching (CBLT).

From a socio-educational and a socio-linguistic perspective, we shall present below a general picture of the teachers' and the learners' profiles in Algeria. These profiles are in fact subject to changes in the Algerian society at different periods of time. The main objective here is to illustrate how social upheavals in Algeria have affected the teaching / learning processes and the Educational sector as a whole.

## The Teacher's Entry and Exit Profile in Algeria

For comparison purposes, we shall use the eighties as a demarcating line to illustrate changes that occurred in the teacher's profile<sup>3</sup>.

## Prior to the 80's

Teaching as a profession was *motivation based*. The would-be teacher of English was undoubtedly someone who, for various reasons (cultural, vocational but hardly ever triggered by instrumental motivation) *wanted to be a teacher*. Teaching was than considered it as a respected and respectable profession in the society. The teacher stood as the source of knowledge inside as well as outside the classroom and he represented somehow the Authority in the city. Prior to getting the job and as a prerequisite for teaching, the would-be teacher was then integrated into teacher-training programs (ITE) for a better practice and an adequate management of his profession.

Teaching was *a profession* and a creative source in terms of cultural and scientific activities. Official texts encouraged at that time the exchanges between the University and the industrial sector in terms of applied research.

For the case of English, there was an open access to educational reviews, journals and magazines on Teaching / Learning English. The magazine "Forum", for instance, to which most teachers of English used to subscribe, was available and the subscription was free of charge. Open air activities such as theatre plays and dialogues in contexts were performed almost daily. Movie sessions, Language laboratory sessions, tape recorders and self-access teaching cards constituted teaching aids, materials and realia available and accessible to teachers to help the learner at school or at university. The relationship teacher-learner was based on mutual understanding. Parents or relatives (even at university level) were part of the game and worried about their children's behaviour at school or at university, their progress and their results.

Algeria. <sup>3</sup>. We concentrate on the Teachers of English in Algeria as a case study.

 $<sup>^2</sup>$  . It is no more called so. The cover label "Licence" is a global term for what is taught in the BA in Foreign Languages in

One may venture to say that teachers were professionals as they were aware of how to handle a class and they represented an honourable profession.

In the 80's, the teacher had an exit profile of someone who had mastered a know-how that can be used and improved by future generations. Teaching was teacher-oriented. Yet, the Statistics of the eighties are indicative of substantial results obtained by pupils and students alike during their school or university studies.

### After the 80's

Teaching has become a *trade* i.e., a transaction for a particular job or task to perform or *a business of buying*, selling, or exchanging goods and services, (Longman, p. 1173) rather than a *profession*, i.e., a form of employment, especially one that is respected in society as honourable and is possible only for an educated person and after training in some special branch of knowledge (Longman, p. 874).

After the 80's and because of abrupt changes and social upheavals in Algeria, together with uncontrolled population movements heading towards big cities, the teacher has become a kind of 'knowledge supplier'. He stands, in some cases, as a provider of *grades* and *marks* for *Evaluation* and *Testing* which are hardly ever conducted and administered properly. In spite of the massive program for higher studies abroad of the eighties whose aim was to provide qualified national teaching personnel, the teacher has become a better knowledge holder to some extent but he / she remained more a knowledge provider than a professional as it were. The exception to this would probably be very few cases where individual initiative has been stronger than the environmental pressures and routine of the teaching at university (handouts, consultation, personal contribution, etc.). The teaching of English and other Foreign Languages in Algeria boiled down to individual initiatives with inadequate teaching material and documentation. University libraries were literally stagnating (no new books or magazines, emptied library shelves, unqualified librarians and personnel, etc.).

For example and within the same Department (that of English in this case), a given module is taught differently from one teacher to another. The teaching staff was fully national and trained locally. The exit profile of the teacher after the 80's was that of someone looking for a full or part-time job to survive financially as unemployment raised extensively as a result of the oil prices sliding down of 1986 in as much as the teachers' salaries had dropped significantly. The teacher became then a job seeker and if he/she was lucky enough he would do some extra hours outside school or university and get paid for them as a trader more than as a professional.

The teacher who used to be a model for the English language and culture did not hold that place of pride anymore. His teaching has become routine work with the same modules being taught over the years without keeping on a par with new theoretical trends or new teaching principles, methods or techniques. This is mainly true for content modules. Even the topics in oral expression, reading comprehension and listening comprehension were the same year in year out. The lack of teaching material, documented literature, teacher training courses, adequate teaching programs etc. did not help to overcome this vacuum where social tensions undermine the teaching itself. Unfortunately, this state of affairs seems to last even today. In fact, the whole question on the teacher's attitude and his motivation towards teaching a foreign language remains open to debate.

### The Student's Entry and Exit Profile

### Prior to the 80's

The student's profile was that of a Baccalaureate holder with an above average in English and a strong motivation to learn this language and its culture. Socially, the father was a skilled worker living in an urban area. Some of the freshers came from mixed secondary schools (boys and girls in the same classroom). Their motives for English language studies were more *integrative* and *cultural* than *instrumental*. These preferences and motivations for learning English were dictated somehow by the environment in the city (American and English folksongs, films, the British Council, The Afro-American Institute, etc.). The teaching staff was partly national and partly expatriate (UK, US, Australia, New Zealand, and India). Algeria was then a promising oil and gas producer heading for socio-economic prosperity.



#### After the 80's

Today's students do not seem to 'worry much' about what or how knowledge in general and learning in particular may help them shape their personality and prepare them for a future integration into a profession. They worry more about an overall average of 10 out of 20 (or an equivalent pass mark or grade) in the exams. The student comes from a mixed urban / rural background. In most cases, the students are weak in English and almost ignorant of the culture of the language they study at university. The motives for a BA in English have become more instrumental than cultural. Attitude and motivation towards the target language (English in this case) have changed substantially in the past twenty years or so. Attitude here refers to the student's general state of apprehension towards the target language and culture. Motivational props at the family and university levels are scarce for the student nowadays. This appears in his basic need in ELT that is to get a degree for a job (rather than teaching as a profession). It is clearly summarised in expressions used among students and produced in the mother tongue. These may be translated as: « I want to *lock* the module» (I want to get a pass mark), «I only need half a point to *close* my module», «I don't think I'll be able to *close* the module this year ».

These sociolinguistic characteristics of the student are closely linked to environmental characteristics for ELT. On the whole, direct contact with the native speaker does not exist. Programs such as «Follow me» and «On we go» that used to be shown on Algerian TV have disappeared from the screen. This may be due to a shortage of supplies in the series. It may also be the result of a dictated language policy. The only contact then, remains through social networks, the satellite TV programs in English and scarcely through written literature available in situ, i.e., in our university libraries and perhaps in some bookshops downtown. Both the TV channels and the book represent a unidirectional contact that is not always very motivating for the student to learn about culture. When the student reaches university, he comes with a cultural background in his own home language (Arabic and Berber in particular), some cultural knowledge in French and a rather poor knowledge of English language and culture. This background knowledge made of a mixture of Arabic (including Berber) culture and French culture constitutes the common layer on which his learning is based.

### **The Current Situation**

As it stands, the quality of L2 instruction is not effective enough to achieve an adequate teaching/learning that not only allows the student to cultivate himself for a better cross-cultural communication but also to preserve his own 'forces propres' and cultural identity. No adequate responsive educational or pedagogical programs have been suggested this far. The BA curriculum dates back to the 1980s (perhaps prior to this date) and no substantial amendments have been made in spite of the drastic changes in the socio-economic picture of the country. The teacher lacks qualified ELT professionalism despite new ELT methodologies and approaches that proliferate in the market. The teaching is often conducted hastily with no suitable teaching material or adequately trained instructors. EFL methodologies and approaches are often made available to the teacher once they are outdated and they most of the time leave him bewildered and intimidated in the performance of his task.

We have this far failed to develop appropriate curricula. As teachers, we still use English as an educational end (i.e., leading to a BA degree). We do not always see it as a means to an end, i.e., a language that opens up ways to global communication and modernity. The question often raised is where does the problem actually lay? Some teachers and course designers see it in the dissimilarity that exists between L1 and L2 which affects language instruction, while they agree that the cultural background (Arabic/French) of the learner may help bridge this gap. Others see the 'cloisonnements universitaires' and the 'malaise social' as the prime factors that hinder the development of a proper English language curriculum where culture understanding and learning should be implemented. Others still blame the student himself whose motivation has become purely instrumental. In any case, they all agree that the lack of internal support (governmental funds) and external material and moral support have a direct impact on the quality of L2 instruction in Algeria. This issue remains open to debate.

Since September 2003 and the amendment of the Educational system in Algeria, together with the Algerian society becoming an affluent and a consumer society and above all with the 'famous' texts of the Réformes de l'Education' (Educational Reforms of 2003), decision makers in Algeria called upon local and foreign experts to implement the Competency Based Approach as a teaching/learning approach and suggest curricula and programs for 'a new vision



and new perspectives' for the training and formation of the 'New Algerian Citizen' through Education, Teaching and Learning.

## Some Views on the CBLT

We shall not embark here on the various shades and shapes of a Competency Based Approach (CBA). The proliferation of definitions of this fairly new approach to teaching and training pushes us to select what we consider as the most appropriate ones for this study and for the Algerian educational system in particular. We shall thus present some typical European definitions of this approach and then expose one or two anglo-saxon definitions of a 'competency'.

A prime distinction between what we were used to in terms of teaching and learning practices and this new approach is that while a time-based teaching is teacher-oriented (centred) and progression is essentially based on a time unit (teaching/learning schedule or programme), the Competency Based Language Teaching is learner-oriented (centred) and based essentially on progression in terms of the acquisition of specific knowledge and skills<sup>4</sup> to perform tasks. The key concept is obviously the concept of '*Competency*'.

An overall definition of the concept of competency is that it encompasses a 'know-how-to-do' and a 'know-how-to-act' combined together and acted out under specific conditions. However, these two factors have been subject to debate<sup>5</sup> for a long time. Perrenoud (2000) rejects the factor of 'know-how-to-do' as elements of a competency which he defines as:

La compétence n'est pas un état ou une connaissance possédée. Elle ne se réduit ni à un savoir ni à un savoir-faire. Elle n'est pas assimilable à un acquis de formation. Posséder des connaissances ou des capacités ne signifie pas être compétent. On peut connaître des techniques ou des règles de gestion comptable et ne pas savoir les appliquer au moment opportun. On peut connaître le droit commercial et mal rédiger des contrats. (Perrenoud, 2000 : 45)

Perrenoud insists, as it were, on the fact that a competency does not boil down to knowledge per se, nor is it a knowhow-to-do on its own. It is rather a manifestation of some skills in particular circumstances and at a particular time.

For a clearer definition, De Ketele (1996) attempts to break out a competency into its basic constituents. He defines as:

... un ensemble ordonné de capacités (activités) qui s'exercent sur des contenus dans une catégorie donnée de situations pour résoudre des problèmes posés par celles-ci.

## (Xavier Roegiers, 1999:65)

The key concepts that envelop the general concept of competency, according to De Ketele, are capacités (skills), contenus (contents) and situations (contexts). It stands as an integrating concept in comparison to specific objectives of the former approaches to teaching. It envelops at the same time the contents of the course in terms of acquired knowledge, the activities that are subsequent to this content, and most of all the situations in which these activities are put to work.

Johanne Myre (2000) also spells out what she considers as prime features of a competency. Accordingly, a competency emerges when the following characteristics are observed in the learner's behaviour and actions:

- elle se démontre par des résultats observables;
- elle fait appel à plusieurs habiletés;
- elle a une valeur sur le plan personnel, social ou professionnel;
- elle est associée à la réalisation d'activités que l'on retrouve dans des situations réelles;

 $^4$  . A skill is enveloped in a task or tasks that the learner performs within a given competency e.g. interact orally. It usually requires cognitive and motor functions such as performing a form of address in the foreign language with the necessary behaviour and the required greeting forms. It is knowledge- and attitude-based in this case. In the technical field, a skill is easily detected during the manipulation of instruments or equipment, e.g. mantling / dismantling a tool or a machine (a drill, an engine, a fridge, etc.)

<sup>5</sup>. The term 'savoirs' is often used as a blanket term for "knowledge". It was then divided into 'savoir-faire', 'savoir agir' and 'savoir-être'. This in turn was split out into 'savoir-redire' and 'savoir-refaire' that belong more to a skill than to a competency (cf. De Ketele, 1989, in Xavier Roegiers, Une pédagogie de l'intégration, De Boeck, 1999, pp. 55-56



### • elle permet de mettre à profit des habiletés.

In other words, Myre (2000) argues that a competency is demonstrable in terms of observable facts (performance of the participant – learner / student). It requires various skills, it represents a personal achievement in actual situations and contexts and it helps to make use of the skills of the performer (learner / student).

Gillet (1991) argues along the same lines:

La compétence est un des principes organisateurs de la formation. Elle s'inscrit dans une logique d'organisation de la formation qui supplante la logique d'exposition des contenus. La définition des contenus est imposée par la compétence et non par le développement expositif de la discipline. C'est elle qui est le maître d'œuvre dans la composition d'une formation.

#### (P. Gillet 1991: 72)

Gillet stresses on the fact that in terms of teaching programmes, the contents are dictated by the competency(ies) that are going to be installed. This view diverges from the traditional approach in teaching programmes whereby the contents of the course are prior to the skills to be attained by the learner. This is paramount for syllabus designers and text-book writers who must think in advance of what competency (ies) must be installed in the first place before they think of the content of the discipline. This is far from what we used to find in text-books in terms of the lesson followed by some practical exercises and drills to make sure the learner has grasped the content of the lesson. In fact, this approach requires that the learner puts into practice and acts out the knowledge he has received in problem solving tasks.

In the Programme d'Anglais (2ème Langue Etrangère (3ème Année) of the Ministry of Education (2001), a competency is defined in these terms:

La compétence est un savoir-agir qui intègre et mobilise un ensemble de capacités, d'habiletés et de connaissances utilisées efficacement dans des situations problèmes, circonstances variées qui peuvent ne jamais avoir été rencontrées.

### The Teacher / Learner under the CBLT

#### The Teacher

The teacher should reconsider his teaching behaviour and procedures, his techniques and motivations in order to create a new environment for himself and his learners under the CBLT. In fact, it is no more a situation where he/she should spend hours teaching a given subject while his learners try to store as much as they can for future evaluation in class. The teaching will be based primarily on putting the learner in several situations and contexts which become increasingly complex as the course develops. The teacher should train his learners to follow procedures which help them carry out tasks to discover new situations. This requires the need to put the learner in authentic and increasingly complex situations. The teacher must check the performance of a task and the knowledge which is necessary for the performance of a particular task. This is mainly true when we, as teachers, ask the learner (who has carried out a task almost to the perfection) the question why he/she used such or such a procedure, or why he/ she started with a given procedure and finished with another. In most cases, the learner would not be able to answer these questions. This is in fact due to his / her meta-knowledge where several processes based on his own experience are put to work and gathered to carry out a task. Basically, the learner acts by using his primary knowledge (knowledge not necessarily acquired in class) with that which he/she learnt in class. He must be led to feel that he has to organize his knowledge to perform a task.



#### **The Learner**

The learner can interpret and produce verbal and nonverbal messages of average complexity in English. He can use personal working methods and share it with groups (negotiation, exchange of ideas, etc.). He is equipped with strategies to face problem situation and he has some knowledge of the cultures of the Target Language. He can interact in real situation inside and outside class. He can interpret authentic documents of average complexity with a certain degree of autonomy. He can hold an informal talk in simple and correct English. He can exploit and interpret authentic documents of average complexity and produce oral messages and relatively elaborate writings.

As an exit profile, the learner is supposed to have consolidated pre-required language material with some methodological procedures to perform a task (mémoire, Magister, etc.). He is able to interact in real situations by using transversal competencies on a wider scale (intercultural contacts). He can interpret more complex authentic documents in a rather more autonomous way. He is ready to re-invest acquired knowledge for professional purposes. He is able to act adequately in English with fluency, accuracy and a relative spontaneity.

His motivation increases as the task of problem solving he has been trained to perform can be projected in real life situations. He gets the feeling of giving significance to the task rather than prepare for a test or an exam. During the presentation of a task the learner feels the need to put to work his knowledge and know-how. Knowledge and the know-how the learner acquires during a problem solving task and its realization can in turn be put to work (completely or partially) to carry out other similar tasks or more complex ones. The teacher checks if a given competence is installed as the learner chooses for himself the procedures he knows. The teacher should also check if these procedures are adequate for the performance of the task in question.

We conclude this paper with some steps to follow under the CBLT. These steps are landmarks for discovery, observation, application, reformulation and control. They allow the learner to:

- To observe
- To discover what he is being trained for.
- To analyze a given problem solving task
- To get involved in targeted exercises and activities that are part of his training
- To be evaluated.

One of the primary advantages of CBLT (CBA) is that the focus is on the success of each participant. Watson (1990) states that the competency-based approach "appears especially useful in training situations where trainees have to attain a small number of specific and job-related competencies" (page 18). Norton (1987) includes benefits of CBLT and identifies in the following terms:

- Participants will achieve competencies required in the performance of their jobs.
- Participants build confidence as they succeed in mastering specific competencies.
- Participants receive a transcript or list of the competencies they have achieved.
- Training time is used more efficiently and effectively as the trainer is a facilitator of learning as opposed to a provider of information.
- More training time is devoted to working with participants individually or in small groups as opposed to presenting lectures.
- More training time is devoted to evaluating each participant's ability to perform essential job skills.



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# The Development of Activities on the Scientific Caricatures Related to Provide the Awareness on Recycling for the Elementary School Students

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## ABSTRACT

The most important structuring occurs in the years of elementary school in order that the sensitive societies which have awareness on the environment with the training of environment, which turn the awareness to the lifestyle are formed and this awareness is handed to the next generations. It is necessary that the teachers use the method and techniques to attract the students' attention in order that the environmental awareness is gained in the students and the awareness becomes a permanent one. It was aimed in the research to develop the scientific caricatures related to raise the knowledge and awareness about the varieties of domestic solid wastes, their collection, transport, recycling and the products from the recycling for the elementary school students. Three activities were prepared within the scope of research, the pilot scheme was done with 40 elementary school students in total who received their training at the first, second, third and forth grades in the center of a province at Turkey's north in order to determine whether there are the parts which aren't understood in the activities which are prepared or that the students can have difficulty in them. It is expected that the learning by doing and experience occurs as the active participation of students to the process is provided with the use of caricaturethematic activities, which are prepared within the scope of this research, in the process to teach the distinction of domestic solid wastes' varieties and the recycling. The use of visual materials in the learning will develop the individual's creativity as it is important in order that the meaningful learning occurs and those to be learned become permanent.

Keywords: elementary school student, scientific caricature, solid waste, recycling, awareness

## INTRODUCTION

The training on environment aims to create an awareness related to the environment and environmental problems in an individual (DPT, 1994), to gain the positive and permanent behaviors to the individuals as affecting their behaviors, and they have an active role to solve the environmental problems (Şimşekli, 2004; Eilam & Trop, 2012). The environmental awareness will be transformed to the next generations as the sensitive societies which have an awareness on the environment with the training of environment, which turn the awareness to the lifestyle. The training which is given in the small ages is very important for the occurrence of positive attitude, perception, behavior and awareness related to the environment (Dewey, 1996). The structuring of values related to the environmental problems occurs especially in the years of elementary and secondary schools. Thus, it is very important that the teachers use the method and techniques to attract the students' attention in order that the environmental awareness is gained in the students and the awareness which is gained becomes permanent.

It is possible with taking the different teaching materials to the classroom that the permanent learnings occur in much more effective way in the modern education - training perception. The learnings occur in much more effective way as the teaching materials address to many sense organs (Fidan, 2008). Especially, the much more effective results of visual teaching materials are gotten in the teaching rather than the other materials.

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So, the searches which have been done reveal that the use of visual materials in the training makes easy to remember the subjects which are learned as it increases the attention and participation on the course (Akçay, Feyzioğlu & Tüysüz, 2003; Örs, 2007).

It is very important that the applications which give an opportunity for the students to learn by having fun in the education are included. The caricature which is one of the applications is an important educational tool which provides to see but not to look which takes the people to think, which gives an opportunity for the individuals to review the environment in the socio-cultural and economic aspects. So the educational searchers state that the caricatures is an important tool which is used to raise the students' creativity, the critical thinking (Alaba, 2007), the learning becomes easier in the caricatures which are prepared in consideration with the interest, development level, age, environment, needs and desires of students (Taş, 2013), they affect positively on the students' success and increase the students' motivation (Bayülgen, 2011), they help students to focus on their attention during the learning, to learn in a meaningful and permanent way as having fun (Koçoğlu, 2017). It was aimed with the research which was done in this sense to develop the scientific caricatures related to raise the knowledge and awareness about the varieties of domestic solid wastes, their collection, transport, recycling and the products from the recycling for the elementary school students.

## METHOD

The research is a descriptive one, the scientific caricatures were developed about "the domestic solid wastes and the recycling" as one of the important environmental subjects to the elementary school students in the research. As it was paid attention in order that the scientific caricatures which were prepared include the samples of daily life, they were designed in consideration with the opinions of elementary schools' teachers and the students' level, and their last manner was provided as they were drawn by a caricaturist.

A pilot scheme was done with 40 elementary school students in total who received their training at the first, second, third and forth grades in the center of a province at Turkey's north in order to determine whether there are the parts which aren't understood in the activities or the students would have difficulty to draw as three activities were prepared within the scope of research.

## FINDINGS

Three activities were prepared with the titles of "*The varieties of domestic solid wastes the separate collection of wastes and the recycling, the collection of domestic solid wastes in the correct boxes and the reinforcement of subject and the transport of domestic solid wastes and the products from the recycling*" within the scope of research. The cards of caricatures were prepared in colorful in order that they get the students' attention in the first activity, the drawings in the second and third activities were prepared in a colorless form in order that they can be painted after they are completed by the students.

## Activity 1. The varieties of domestic solid waste, separate collection of wastes and recycling

The caricature cards which had 100 domestic solid wastes included the separate collection of wastes the recycling at the first activity which were prepared within the scope of research. The scientific caricature cards which were prepared in order to gain an awareness on the symbol of recycling and the boxes of solid wastes for the students were given at Figure 1.



Figure 1. The symbol of recycling and boxes solid wastes

The samples of scientific caricature cards which were prepared on the domestic solid waste varieties were given at Figures 2a, 2b, 2c, 2d, 2e and 2f.



Figure 2a. The varieties of domestic solid waste: plastic



Figure 2b. The varieties of domestic solid waste: paper/carton



Figure 2c. The varieties of domestic solid waste: glass





Figure 2d. The varieties of domestic solid waste: metal



Figure 2e. The varieties of domestic solid waste: waste batteries



Figure 2f. The varieties of domestic solid waste: organic waste

The varieties of wastes in the scientific caricatures which were prepared about the domestic solid wastes were prepared on the base of wastes which would be oftenly seen in the students' daily life. It was aimed to provide with the use of these cards that the students realize the varieties of solid wastes and they recognize those which have the recycling.

The samples for the scientific caricature cards which were prepared to distinguish the varieties of different domestic solid wastes were given at Figure 3.



Figure 3. The varieties of domestic solid waste

It was aimed with those scientific caricature cards that the students realize the varieties of domestic solid wastes and they distinguish by the varieties.

The samples for the scientific caricature cards related to the separate collection of domestic solid wastes were given at Figure 4.



Figure 4. The separate collection of domestic solid wastes

It was aimed with those scientific caricatures that an awareness related to the separate collection of waste batteries and organic wastes occurs in the students with the glass, paper/carton, metal wastes from the domestic solid wastes.

The samples for the scientific caricature cards related to the teaching what the products are gotten from the domestic solid wastes as a results of the recycling.





Figure 5. The products which occur as a result of recycling

It was aimed with the scientific caricature cards that the students realize that paper/carton, glass, plastic and metal wastes turn into the same products but the waste batteries turn into the metal products due to the metal in them.

## Activity 2. The collection of domestic solid wastes into the correct boxes and the reinforcement of subject

The caricature cards related to reinforce the collection of 6 domestic solid wastes in the correct boxes were developed at the second activity which was prepared within the scope of research. The samples with plastic paper/carton, glass, metal, waste batteries and organic wastes were included in those cards. The students were asked to determine which expression is necessary in the caricature in consideration with the boxes that the domestic solid wastes are thrown, and to paint the caricature card as completing them, with those scientific caricatures. The samples for those scientific caricature cards were given at Figure 6.



Figure 6. Samples belonging to the collection of domestic solid wastes

It was aimed with those scientific caricature cards to reinforce the collection of domestic solid wastes in the correct boxes for the students.

## Activity 3. The transport of domestic solid wastes and the products from the recycling

The caricature cards were developed to get the attention on the transport of 8 domestic solid wastes and on what the new products which occur as a results of the recycling are at the third activity which was prepared within the scope of research. The samples for the scientific caricature cards related to the transport of those collected solid wastes were given at Figure 7.





Figure 7. Transport of solid wastes which are collected

The students were asked to select about which facial expressions will be used for the manner that the waste batteries are in the vehicle of waste batteries recycling, at the first of those scientific caricatures. The goal is to provide that the students realize that the waste batteries are among the type of wastes which would be recycled. They were firstly asked to paint the recyclable wastes in the recycling vehicle and to find the wastes which are unnecessary in the recycling vehicle, in the second scientific caricature. They were asked to state which wastes at the bottom of page and in a caricatured form should be in the recycling vehicle and to paint the solid wastes which should be in the vehicle. It was aimed with this activity that an awareness is createcreated in the students d to transport the organic wastes and the other recyclable solid wastes separately.

The samples for the scientific caricature cards related to reinforce which products are gotten from the solid wastes as a result of recycling were given at Figure 8.



Figure 8. Reinforcement of products which occur from recycling



The students were asked to paint which product is gotten as a result of the recycling of paper/carton, glass, plastic, metal and waste batteries with those scientific caricatures. It was aimed to provide with the activity that the students realize that paper/carton, glass, plastic and metal solid wastes will turn into the same products but the waste batteries will turn into the metal products as a result of the recycling.

### CONCLUSION

It was aimed as a result of the research that the learning by doing and experience occurs as the active participation of students to the process is provided with the use of scientific caricature-thematic activities, which were prepared, in the process of teaching the discrimination of domestic solid wastes and the recycling for the elementary school students. As the use of visual materials in learning will develop the individual's creativity, it is important in the event that the meaningful learning occurs and those which are learned become the permanent ones. In this sense, it is considered that the application of scientific caricature-thematic activities will make the value more explicit that is demanded to gain for the students to transfer the environmental awareness and the value of being sensitive to the environment.

When the literature is reviewed, Kılınç (2008) states in his study that the scientific caricatures have an impact positively on the students' success, their attitudes related to the biology lesson and their motivation in the biology lesson. Similarly, it is seen that Üstün (2007) got the result in his study that the academic success increases with the caricatures. Rule and Auge (2005) and Curran (1973) state that the caricatures have an impact to facilitate the subject in the learning process. Moreover, Rule, Sallis and Donaldson (2008) state in their study that the teaching candidates learn much more information with the caricatures and they are motivating. It was determined that the caricature-supportive teaching is more effective than the traditional teaching, in the searches which were done in the subjects of respiratory system (Kılınç & Salman, 2006), environment (Özalp, 2006; Oluk, Özalp & Sarıkaya, 2005; Sezek, Özay Köse & Kaya, 2013), immune system (Özay Köse, 2008), electric (Taş, 2013) and in the teaching of biology (Kaya, Özay Köse & Konu, 2016). All of these results reveal that the scientific caricatures, the development of scientific caricature activities, their application and the review of these activities' impact on the teaching are very important in the each grades of education and the different disciplines.

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## The Effects of Technology on Literacy

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## ABSTRACT

The purpose of this study is to examine the effects of the use of technology on the literacy development, specifically the engagement, motivation, and comprehension skills of, low-literate learners. In considering the technological advances in the current world, we have to wonder about the place of literary in the classroom. Literacy has always been the standard practice, but now technology is the new, exciting innovation in everyone's daily lives (Sternberg, Kaplan & Borck, 2007). Since all this fresh technology use is being mandated upon schools as teachers, we must ask ourselves, "Is technology as beneficial as the idea of it is?" This paper sets out to answer this question through a review of the literature that highlights the many opportunities that students are offered for integrating technology and literacy skills in the classroom. The study will also analyze data from field-based research.

### LITERATURE REVIEW

Technology is evolving at a rapid pace and changing our day-to-day lives in the process. Children know how to post Facebook statuses before they even know how to address a letter. Many schools are converting their systems to go digital, and eventually paperless. Teachers instruct mainly through the use of SmartBoards, and there are tablets or computers in the classroom for each student to complete assignments and assessments. So where do books come into play with technology?

There are numerous websites and applications that offer a plethora of e-books. As this new technology is being implemented in schools, educators ask if is it beneficial. There have been many studies that have shown positive evidence when integrating technology in literacy. Learning with technology can be engaging, but its impact is largely a result of how it is used in instruction by the teacher.

Research suggests that there are various views about technology being used in the classroom for furthering literacy development. First, there are numerous positive outcomes for students when technology is integrated. Students form a community with one another by conversing about the literature they have read on their devices. As a result, learning becomes more engaging and interactive in the classroom. Secondly, students are utilizing technology as another form of communication (Sternberg, Kaplan, & Borck, 2007). In today's world, a vast amount of communication happens via technology. In order for students to be fully versed in various forms of communication, they need to be utilizing technology as a learning tool in their daily lives (Sternberg, Kaplan, & Borck, 2007). Thirdly, e-books make reading more interactive for all students and have multiple extension activities to help struggling readers. Some struggling readers become excited when they discover that they can practice learning new vocabulary or work on their fluency by doing activities on their iPads (Larson, 2015). Finally, technology and literacy are two ever-changing content areas, and it is up to the teacher to prepare students to go out and engage in the ever changing world. Teachers must be able to figure out how to incorporate the natural process of reading with the current, fresh, and polished technological devices to engage students and help them prepare themselves for their future. Through literary research, I learned there are many opportunities for students when integrating technology with literacy in the classroom.



## **TECHNOLOGY'S POSITIVE OUTCOMES**

There are many positive outcomes when integrating technology in the classroom. To begin, technology sparks interest in a student's' mind and, therefore, causes them to become enthusiastic when learning something new (Larson, 2015). Teachers try to make the classroom more engaging because students learn best when both their minds and hands are engaged. Secondly, bringing in technology to the classroom adds a more exciting and new atmosphere (Leu, 2000). Students are eager to try out the new homework apps and compare scores with one another. Research about technology to access books and other literary texts indicates that it is a positive experience. Green (2005) found that, "Computer software and games provide many fun opportunities for students to practice literacy skills" (par. 18). Technology integrated into literacy instruction leads to many positive outcomes in a classroom as it relates to excitement and interest.

**Learning.** Students are eager to try new out new things in the classroom, and in turn, teachers search to find the tools to gain their students' full attention. Implementing technology into the classroom can greatly increase a student's learning potential (Leu, 2000). In an average classroom today, there is more than one computer in the room, and certain schools are implementing one-to-one classrooms, where each student has access to a computer or tablet throughout the day. Having these computers so easily accessible provides students with an incredible tool that "plays an active role in fundamentally shaping orientations to learning, content, and tasks" (Labbo & Reinking, 1999, p. 483).

According to a study that was conducted by Leader and Klein (as cited in Leu, 2000), students that had access to search tools in computer programs performed remarkably above average on literacy skills when compared with students that did not have access to those tools. These students were able to look up unfamiliar vocabulary, learn content in various ways, and work at their own pace without disturbing others. With access to the Internet on a personal device, those students that are ahead in their reading content are "provide[d] opportunities to more critically consider the sources of information" (Labbo, Reinking, McKenna, 1999, p. 484).

Larson (2015) stated that students that have access to e-books can make markups in the margins. These markups and notes help students work on their comprehension skills, and allow the teacher to check for comprehension. Having the student read their personalized grade-level books gives insight to the teacher to see if there is comprehension progress for that student, and what plans should be made next (Larson, 2015). If students are able to further their own knowledge of content, and apply it to their own lives, they will ultimately become more excited with learning.

Students that used technology to research and write showed tremendous literary success (Owen, 2000). "Their writing was stronger, their ideas were interesting, and the more interesting the ideas became, the more interested the students were in their work-the more they saw the work as their own" (p. 132). Computers, as well as other technological devices, are granting students with numerous resources to enhance learning across content

**Engaging.** In order for a student to learn the content and be able to apply it to their life, they must be fully engaged in the lesson or activity. Technology engages children of all ages with its' flashy graphics and endless possibilities of games and resources. As far as technology's place in the classroom, using it as a reading tool is sure to engage most students, allowing students to become more enveloped with the book due to its many features (Larson, 2015). Reading online books from different applications on devices gives students the opportunities to have the book read to them in different voices, with added sound effects, and vivid illustrations. These features can transport students visually into the book and make them more aware of the storyline. Applications on these devices also have extra features for students to manipulate and attempt "to practice literacy skills" like constructing sentences and summarizing readings (Green, 2005). Reading e-books allows students to stay engaged by participating in activities that they find most exciting and beneficial for their own personal literacy level.



**Building Community.** Working with technology in the classroom allows students to practice communication skills and literacy skills with one another. Class discussions, or discourse, can be hosted on blogs where each student can electronically post a reaction, question, or comment about a reading, which could be a less intimidating version of a class discussion for students. Owen (2000) found that when students were writing with technology they, "interacted in ways that were a little like 'talk,' but also a little like 'writing,'...their online interactions were quite like the very best of class discussions, only richer, deeper, and more reflective than most of our period-bound classes could sustain" (p. 132). Likewise to Owens, Green researched that students were more engaged in discussion when they read e-books. Green (2007) found that students become more "interactive and excited" when reading a book on an electronic device. These devices held students' attention in different ways than reading a traditional book (Labbo, Reinking, & McKenna, 1998). This virtual reading environment builds "language development by providing an opportunity for verbal interaction" (Green, 2005, par. 9). Fostering literary discourse in the classroom among students builds a strong community where students feel comfortable to speak up and interact with one another about texts that they have read.

## **TECHNOLOGY'S VARIED FORMS OF COMMUNICATION**

Today, there is an overwhelming amount of conversations being communicated through technology. In order for students to be completely proficient in various forms of communication, they need to be engaging with technology.

Technology has completely morphed the way we communicate. The era we live in now is consumed by digital communication; doctors appointments can be confirmed by a reply to a text message and results are sent via email. In order "for students to be fully literate in today's world they must become fluent in the new literacy practices of information and communication technologies" (Sternberg, Kaplan, & Borck, 1998, p. 418). Students must be immersed in technology to be aware of the different features to communicate with one another. Technology use in the classroom is rapidly spreading all over the world, and "new technologies for information and communication will continually be developed" (Leu, 2000, para. 21). Creating these new technologies means new methods for communication and literacy will follow. Students must never stop studying the ever-changing means to learn and read about new content and converse with one another (Leu, 2000).

### THE INTERACTIVENESS OF E-BOOKS

Electronic books (e-books) excite students and provide them with multiple variations for literacy instruction (Larson, 2015). Students become more determined when they are able to work on multiple facets of reading, such as word work, through one app.

For students, e-books can make reading come to life. The illustrations are vivid, they can hear the book being read to them, and look up unfamiliar words by just clicking a link. The two main reasons that e-books are beneficial for students are the multiple ways they help in assisting struggling readers and the interactive literacy programs that help extend their learning from the book. E-books offer a wide range of attributes for a diverse population of readers (Larson, 2015).

**Struggling Reader Assistance.** Students that have been labeled as struggling or slow readers require the most instruction from the classroom teacher. These are the students that are most likely to get off task, not pay attention, and become distracted or bored during reading time. Struggling readers start to lose confidence in their academics, and begin to give up on all content work. E-books "helped [the struggling readers] gain confidence in their reading abilities" (Larson, 2015, p. 44). E-books have a remarkable amount of features that engage and assist all students. In certain e-books, "the text can be highlighted in the e-book while [the students] listen to the audiobook" (Larson, 2015, p. 44). This multi-sensory reading is a crucial component of literacy instruction for struggling readers because they are given the opportunity to have the book read orally, the text to be simultaneously highlighted, and the choice to pause the book when questions or remarks arise.

**Interactive Learning.** Every student reads and learns at his or her own pace. When students read books, they create their own personal connections and thoughts throughout the process. With most library books that students check out from the classroom, writing in areas within the text or highlighting certain passages are not permitted. In turn, this can hinder students' learning process because they may forget specific aspects of the book that made it more enjoyable (Larson, 2015). However, when reading from e-books, students have the freedom, and encouragement from teachers, to make notes in the margins and highlight parts of the text whether for questions or connections (Larson, 2015). Teachers can also gain a lot of knowledge from the "student-made" comments in their readings, check for a solid comprehension and questions that may have arisen during reading, and "get a glimpse into each reader's mind" (Larson, 2015, p. 46). This way, teachers can get an idea on what they should review as a class or individually with students. Teachers can also check for progress among all students and recommend different books or activities to further students' growth. E-books provide benefits for both teachers and students in the classroom.

### TECHNOLOGY'S USE FOR PREPARING STUDENTS FOR THE EVER-CHANGING WORLD

Technology and literacy are two of the most flourishing and constantly evolving content areas in our world (Leu, 2000). Finding a good job in the current, competitive market requires a person to have both strong literacy and technological skills. Literacy has always been a standard practice, but now technology is the new, exciting practice that is entering the workforce (Sternberg, Kaplan, & Borck, 2007). In order for students to be well-versed in both of these practices, teachers must be aware of today's' growing culture of technology and be able to prepare their students for their future; teachers must be able to have students practice combining traditional and new practices. Teachers can prepare their students by implementing technology into their daily classroom learning environment, especially through literacy instruction. In order for teachers to enhance their students' learning with technology, they must be confident and knowledgeable about the various types of technologies. Teachers must "become skillful with a variety of informational technologies, engage in critical analysis of media and technology, and learn to integrate technology and information literacy into instruction" (Cervetti, Damico, & Pearson, 2006, p. 379). Instead of just allowing a student to use an iPad to play a game after a completed assignment, teachers must be able to incorporate technology into their instruction to show students how electronic devices can assist in learning. Since technology is forever advancing, it will become imperative for teachers to make sure their "digital literacy instruction in the classroom [is aligned] with its eventual application in the larger society" (Labbo, Reinking, & McKenna, 1998, p. 275).

### CONCLUSION

Technology is continuously enhancing and changing our daily lives. Today, technology is rapidly claiming its place in the average classroom by serving as a means for literacy and math practice, as well as dictionaries and encyclopedias. Technology gives students an engaging and new method of learning, helps students build a strong community, and offers students another form of communication with which they will constantly grow and evolve. There are many positive benefits that show how technology can help all students, especially diverse learners. This study is designed to investigate the benefits of integrating technology into daily literacy instruction.

### **PROJECT DESCRIPTION**

In the field-based research, I conducted digital guided reading sessions using iPads with low-literate third graders and collected data that displayed positive literacy growth (engagement, motivation, and comprehension) among the students. Students accessed the app Raz-kids on their personal iPads for our sessions (See Appendix A). For each session we chose a book, previewed the cover, completed a pictures walk, and looked at the glossary or index before reading. Students rotated through reading each page of the book, pausing after their page to be asked comprehension questions and make personal connections throughout. Once the book was read, we discussed the content and then took the quiz provided by RAZ kids, which consisted of five comprehension questions. After the students have finished the quiz and got their scores, we reviewed the different questions and answers to clarify any confusions amongst the students.



## PARTICIPANT DESCRIPTION

The first group of students I worked with were third graders whose pseudonyms were Allie, Carson, Tianna, and Roger. Allie and Carson had just moved up to a Level J reading level on the Fountas and Pinnell scale, which correlates to a late first grade, early second grade reading level. Tianna and Roger were on Level I on the Fountas and Pinnell scale, which correlates to a first grade reading level. These four students lacked engagement during reading groups, and did not have strong comprehension skills. The second group of students I worked with were third graders whose pseudonyms were Louis, Zach, and Roger. The two new students, Louis and Zach were on the same reading level as Roger, Level I. Zach is on the spectrum; he has a difficult time staying focused and engaged on the reading, which negatively affects his comprehension skills.

Please note that there are two different groups of students I worked with throughout this intervention, because three out of my four students in the first group advanced beyond the level needed for intervention and are now reading on the required third grade reading level.

## **PROJECT OUTCOMES**

Based on the literature research, I saw technology having positive effects on the literacy skills of third graders. I believed that the technology would excite the students more than a physical book will. The e-book app Raz-Kids has many accessible features, such as varying levels, text-to-speech, and vivid illustrations. I saw that the third graders had a rise in comprehension, enthusiasm, and motivation to practice their reading when using this application during this project. The text-to-speech is not monotonous, and the students are able to play/pause throughout the reading in case they need clarification of a word. I believed these students also benefited from the small group guided reading instruction; they were able to help each other with vocabulary, comprehension, and even technological support.

#### ASSESSMENT OF PROJECT

I measured the students' growth by using the comprehension assessments created from the application Raz-Kids. These assessments consist of five comprehension multiple choice questions that can only be completed after the student reads through the text. I assessed the students' progress by taking field notes during each session. After the field-based experiment was completed, I administered a survey for the students to complete via paper that asked a series of questions about their personal experience in the small groups guided reading with iPads. These surveys have been typed and are provided (See Appendix B).

### ANALYSIS OF PROJECT

For the first visit in October, I gathered my four students into our guided reading groups. After planning with the host teacher, we concluded that it would be best to start on Level I books, and work our way up to Level J. At the beginning of my first visit, we discussed the feelings the students have using the iPads versus regular books in class. All of the students said that they love using the iPads for reading and other school work because they had more fun, and got to do a lot of different activities.

After we got to know each other better, I passed out the traditional, paperback book *Mystery of the Bay Monster* (Fetty, 2008), and had students flip through it to look at pictures and make inferences about what they believed it was going to be about. During the first visit, the small group used actual books and paper assessments. We first previewed the book and learned the new vocabulary. I used pictures to help the students make stronger connections with the new words. When it was time to start reading, students took turns reading a page from the book, while I asked comprehension questions throughout.



During our reading, Allie and Carson were quick to raise their hand to respond to the comprehension questions. Tianna always raised her hand, but when called upon, had to go back in the reading to find the answer. Roger had to be prompted to answer, and he always went back to re-read the pages before answering. Roger struggled during his turn to read the most, however, he could tell you exactly what he just read. When he did not know a word, he would pause and just look at me to help him pronounce it. Once we finished reading the book, I had students share with each other about the ending.

I then passed out comprehension reading check questions that they worked on independently. There were five multiple choice questions. I first let the students work on them independently, then I read the questions aloud a second time. Roger and Tianna both got all the questions correct the first time, while Allie and Carson missed one question both times. We then talked about how for the next visits we would be using the iPads to read and take quizzes. The students all spoke about how they believe the books will help them stay focused and learn more.

For the second visit, we read the book *Healthy Me* (Freed, n.d) from Level I on Raz Kids. We previewed the book, the students made connections about certain pictures, and I introduced the two new vocabulary words that we would come across in our text. Each student took turns reading each page, while I asked comprehension questions throughout. Allie and Carson did not struggle with any words, and were always the first to respond to the questions asked. Tianna and Roger struggled across a few words, but were able to answer questions by referring back to the text. Roger seemed more focused on pronouncing the words correctly when it was his turn to read aloud, rather than what the content said. He also tried to flip ahead in the book to see what page it was his turn to read. I pulled him aside after to talk to him about following along and not to worry if he mispronounced the words, I would work with him to get them right. Once the book was read, I asked some follow-up questions, and all the students answered correctly. The assessment was five multiple choice questions on the Raz Kids App. Allie, Carson, and Tianna all made 5/5. Roger took the quiz by himself, without having the questions read aloud to him, and scored a 3/5. When I sat with him to read the questions and choices aloud, he scored a 5/5. After talking with the students and host teacher, we decided to move on to books being read on Level J. The students picked out the book for next week, and previewed the cover.

For the third visit, Tianna was absent, so our group was just Allie, Carson, and Roger. The students chose to read the book, *Wiggly Worms* (Reifsnyder, n.d), on the app. During our preview of the book, all three students did a strong job making connections with the illustrations of the words in the book; Carson mentioned that there were always worms near his grandmother's garden, and that he knew their body was made up of more than one part even though it only looks like one. This nonfiction story had more scientific and complex words throughout. Even though the words were previewed at the beginning, Roger struggled reading those words throughout, while Carson and Allie were able to take what was taught in the preview and apply it when they read. Carson and Allie answered comprehension questions after the pages that were read, but Roger focused more on reading his words than grasping the content. Roger's assessment was read aloud and he scored a 3/5. Carson and Allie scored 5/5 on the assessment taking it independently, and were able to discuss answers after we talked through the assessment.

For the fourth visit, the students chose to read another nonfiction book titled, *Sharks* (Freed, n.d). During our book preview, we spent a lot of time looking at the introduction to see all the new vocabulary. We also looked up pictures of the types of sharks we would be learning about. I kept the words and pictures up on my computer as we read the book so the students could reference them during their reading. Carson and Allie read their pages fluently, not stumbling over the new content-specific vocabulary. Roger and Tianna both focused more on reading those new vocabulary words correctly, instead of the content. We reviewed the book after everyone read, and then the students took the assessment. All four of the students scored 5/5 on the assessment. The assessment was read aloud for all students. Once we regrouped after going back over the test questions, Carson and Allie both said they wanted me to choose more challenging books to read for the upcoming weeks. However, Roger and Tianna did not agree with that proposal.



On the fifth visit, we read the book, *Why do Leaves Change Color*? (Freed, n.d). All the students were eager to start reading this because they said it relates to what they had been learning about in class. Since Allie and Carson expressed that they wanted to read more challenging books our sessions, I decided that they could help us by retelling and explaining what was read after each couple of pages. There was one vocabulary word to pre-teach, photosynthesis, and the students were already familiar with this word, so we got started quickly. Allie and Carson did an exceptional job retelling what was read, and explaining different stages of the process of leaves changing colors. While Roger struggled over the vocabulary word, he benefited from Allie and Carson's retelling. Roger was stumped by the vocabulary word and would zone out while his other classmates read their pages. Allie and Carson scored 5/5 on the assessment the first time that they took it. Roger and Tianna scored 2/5 the first time. We went through it again and the students understood their mistakes. Allie and Carson talked Roger and Tianna through the questions, referencing to parts in the story.

On my sixth visit, we read the fiction story, *Hannah's Townspeople* (Sweeney, n.d). We talked about the difference between fiction and nonfiction books, and what the students predicted would happen in the story. From the beginning, while we were previewing the book, every single student seemed engaged and excited to read it. There was a lot of academic discourse occurring between the students about what they thought was going to happen in the story. Allie and Carson read their pages fluently, made inferences after each reading, and retold what they just read. Tianna did a great job of reading more fluently, and not getting stumped up on pronouncing words. I saw great improvement in Tianna when it was her turn to retell parts of the story. Roger also improved a great deal when it was his time to retell parts of the story, but still paused and waited for help when he struggled with words. At the end of the reading, all the students were eager to answer comprehension questions. Everyone scored 5/5 on the reading assessments. Even once the assessment was finished and we discussed the story, the students were still conversing about the story and adding their own opinions about the story.

For my seventh visit, and last visit before the New Year, the students chose to read a nonfiction book *Number Twelve* (Osborn, n.d). We previewed the book and then began reading. Roger seemed to quickly lose interest while his peers were reading, and told me that he wished that the book would have been like the one they read last week. I was also hoping the student would choose another fiction book, similar to last week, because they all seemed more engaged and excited while reading. There were a lot of math connections in this book, and Tianna and Carson asked questions about it. To try and make a connection, I would show whatever the math was on the whiteboard for them. While the students were excited to connect what they read to what they know in math, they would forget about the book and just ask more math questions. This book was hard in keeping everyone's attention. The test was read aloud for the students, but Carson and Allie took it on their own, finishing first, and scoring 5/5. Tianna and Roger scored 4/5 on the quiz. After the assessment, we went through the questions and corrected the one that was missed.

My eighth visit was at the beginning of the New Year, and I found out positive news about Carson, Allie, and Tianna. These students were tested, scored at a higher level, and were moved into different reading groups. Roger's reading level remained the same, level I. I was able to gain two more into my new group with Roger. For our session, we read the book *Three Little Pigs* (Sweeney, n.d) on Level I on the iPads. Roger was more fluently reading Level I than he was reading Level J, however he seemed embarrassed and was upset that I was making him read a Level I book, since we normally work with Level J books. The host teachers and I chose to work on a Level I book at the beginning so I could get a stronger grasp of the students' strengths and weaknesses, and then move back up to Level J.

Louis was excited to read, and read his parts with expression. Zach was very shy, but opened up towards the end of the session. Zach seemed to focus more on just getting through his page, rather than really concentrating on what it was saying.



He stumbled over a few words, but had the most trouble with comprehension. When I would go back and ask him what happened on his page, he could never give me a definitive answer, and needed help from the other two students. I read the assessment aloud to all the students. Zach scored a 2/5, Roger scored a 1/5, and Louis scored a 4/5. We went back through the quiz and talked through each of the questions and went back to choose which one was correct and why their answer was incorrect. We practiced going back in the text to look for answers when questions or disagreements arose.

On my ninth visit, we chose the book *The Thanksgiving the Jacks Built* (Bakker, n.d). Roger was excited to read this, because he quickly saw it was a fiction book and he knew he would enjoy the story. We previewed the book by looking at the title, making some predictions, talking about what we thought the family would be like, and then began reading. All three of the boys read their pages of the book very well; both Roger and Louis stumbled over a few words. The book had a repetitive rhyme to it. After about the third time, Louis and Roger spoke up saying that they had already read this part before. Louis said he really liked how it repeated and rhymed, and how it made him want to sing it. Zach was highlighting the rhyming parts on the different pages so he could go back to see what was added over time through the story. He was able to quickly answer my follow-up questions after we finished reading because of his highlighting. Zach was able to utilize helpful features on the iPad to help him recall parts of the story. For the assessment, I read the questions aloud like usual, but Roger and Zach went ahead and were not fully focused. On the first try, all of the boys scored 3/5. They all missed the same two questions that dealt with inference answers. We talked about inferencing, and focused on what they would do if they were the character in the story to solve the question. After we read through each question and answer once more, all the boys scored 5/5.

For my tenth visit, we read the book *Riding with Rosa Parks* (Forrest, n.d), which was Louis's choice. We previewed the book first, looking at the cover and talking about what we already knew about Rosa Parks. All three of the boys did a great job reading; they worked on sounding out the words by themselves, and making connections with what they read. Louis and Roger stayed engaged in the story. The two boys said what they would have done if they were in Rosa Park's position and how they would have fought to change the rules. Zach read through his parts really fast, sometimes stumbling over some words, but he always went back to repeat them when prompted. For the assessment, I read through the questions like usual. Except this time, Zach sped ahead and tried to complete the assessment by himself. He ended up scoring a 1/5. Louis and Roger listened to the questions and scored a 4/5. When we went through it the second time, Louis and Roger explained their answers, and Zach scored 5/5 the second time around. Zach even told me he did "bad the first time because I took it way too fast and did not read like I was supposed to." Looking ahead to my next visit, we decided to choose a book for the boys to listen to before we read it in our group next week to try and give the students, especially Roger, more confidence in his reading.

For my eleventh visit, the boys were supposed to listen to the book, *Darby's Birthday Party* (Roberts, n.d). Zach was out sick, so I just had Louis and Roger today. Roger ended up leaving his iPad at home, so he had to borrow another one. He was also having some classroom issues in the morning, so he was not cooperating. When we got settled, Roger was the only student who previewed the book by listening to it, so he recalled the characters. Both Louis and Roger worked extremely hard. Roger really concentrated on sounding out words, and using illustrations as clues to decipher words. They were both also able to answer all comprehension questions without having to look back in the story. Despite the distractions and issues, Roger maintained his focus while reading, using his illustrations as clues to decipher words and really concentrated on sounding out words. For the assessment, I read aloud the questions. Roger was able to take the test on the borrowed iPad. Both Roger and Louis scored 5/5 on the first time and were able to talk and go over the questions fluently. We listened to the book *The Thanksgiving the Other Jacks Built* (Bakker, n.d), and we planned to read it next week. I wanted to see if listening to the book before reading would help the boys when they actually sat down to read the pages.



For my twelfth visit, I only had 2 boys, Louis and Zach, Roger was out sick. We previewed *The Thanksgiving the Other Jacks Built* (Bakker, n.d), and talked about what we remembered from listening to it last week. The boys did a great job reading today, even though we were pressed for time because of school visitors. They read slowly, and sounded out words before giving up. Zach did a great job identifying words and telling me what he read. His comprehension improved greatly. Louis and Zach were very engaged in the story; they listened intently to each other read the pages and made comments during the story. Both boys listened intently and took their time when taking the assessment. I read the questions aloud and the boys scored 4/5 on the first time, and then scored 5/5 on the second time when we talked through it. We picked out the book for next week and previewed the cover. The boys planned to listen to it before I came back, and I gave Roger's teacher the plan to make sure everyone would be on the same schedule.

For my thirteenth visit, I had all 3 boys for our small group. Roger had a difficult time getting settled today. He got his iPad privileges revoked this past week because he was listening to inappropriate music, so he was not completely reconnected. He did get his iPad back for our session. We read the book *The Disappearing Moon* (Butler, n.d), after the boys listened to it. The students did enjoy reading this book. Roger did a fantastic job sounding out words before just giving up on them. He also did a lot better comprehending the story and answering the questions. Zach did a great job reading his pages and trying to answer the questions. Louis read very well, but while the others were reading their pages, he did have trouble paying attention. I would catch him looking off into space, and it was difficult getting him refocused back on the story. When we did the assessment, I read the questions aloud for the students. Zach and Louis got 4/5 on the first time and Roger got 2/5. The second time around when we talked through the questions, everyone got 5/5, and the boys were able to tell me why they picked the wrong answers the first time.

My fourteenth visit, we read the book, *Welcome, Carlos!* (Boelts, n.d). Today I had all three boys and we had a fantastic session. We previewed the cover and the boys discussed what they remembered the book to be about after listening to it last week. After we discussed, the boys started to read. Roger read all his pages without stopping and asking for words, which was a huge personal improvement. He has improved so much over the span of our sessions. Louis had a tough time sitting still again today, but he still was following along with the story. Zach also read really well today; he struggled through some of the names in the story, but he slowed his reading down, and did a great job comprehending the story. Louis and Roger scored 4/5 on the first assessment, Zach scored 3/5. When we went back through it, everyone scored 5/5. The assessment questions were still read aloud to the students, but Louis and Roger did not wait for me to read through each one. I ended up not reading the last question, because I could tell the boys were reading the assessment questions well on their own and at their own pace, and I did not want to interfere with that. Zach did ask me if I could go back and re-read another question, which I did, but I wanted to give the boys an opportunity to read it on their own and gain confidence in their reading holistically. Roger did have a smile on his face after finishing his reading today and when he finished the assessment, only missing one question. We also chose our next book, and previewed it for next week.

For my fifteenth visit, we read the book *Leopard, Ram, and Jackal* (Stone, n.d). There were a few vocabulary words that needed to be taught first. The boys struggled with grasping what type of animal a jackal is. Even when we used pictures and looked at different images on the iPad, the boys were still confused. Roger read his pages with more confidence today; he only paused at a few words, asking for my help. Zach read with the most confidence today, he even helped his classmates with certain words when they were struggling. Louis also read with confidence today, but he read very quickly. I did have to ask him to re-read a few pages because he skipped over sentences or misinterpreted his content. After we read, we talked about what happened in the story and went back through the new vocabulary. For the assessment, I chose not to read the questions for the students to see how the boys reacted to doing it completely on their own.



Roger and Zach scored 3/5 on their assessment and Louis scored 2/5 on his assessment. We looked back at the questions the boys missed and went back in the reading to find the answers. Roger said he knew that he was reading the assessment too fast, and he should have slowed down. This is another huge growing step for Roger with his self-correction. After we talked more about the assessment, we chose our next two, and last, books for us to read for the last two sessions.

For my sixteenth visit, we read the book *Firefighters* (Knight, n.d). Roger, Louis, and Alex were enthusiastic to read this book. Roger had a lot of personal connections with this book from TV shows, video games, and movies that he has seen. Roger did a strong job reading at a steady pace, and even commented to Louis on how he should slow down his reading to prevent stumbling over words. Alex enjoyed the book and also made personal connections in the text. For the assessment, the boys decided to read the questions independently. The first time through, Alex scored a 3/5, Louis scored a 5/5, and Roger 4/5. We went back over the questions with me reading them aloud and the boys all corrected their mistakes and scored 5/5.

For my last visit, Roger, Louis, and Alex filled out the surveys (See Appendix B) regarding the study. We talked about what the differences were when reading the books off of the iPad rather than actual book. I pulled each student individually and recorded their answers so the boys could each have enough time to actually talk about their time reading on the iPads without being pressured to write it all down before time was up.

## COLLABORATION

While I worked with the students in guided reading groups only using iPads, they were also getting literacy instruction via iPads daily in class. The students were administered a survey at the end of the study to give them a personal opportunity to reflect on the experience. They each had strong opinions on using the iPads with their literacy instruction (See Appendix B). The students liked the fact that the e-books had vivid images, and allowed them to highlight words that they were unfamiliar with. While some students would have preferred one-on-one intervention, others liked the group setting because they were able to hear their classmates read and work together when trying to make predictions for the story. The students became familiar with all the different settings and features that are offered on the Raz Kids app, and were able to utilize them to their best ability during our sessions.

Having the students placed into a setting with their peers, had a great effect on their learning. The students were familiar with each other, and by the end of only a few sessions, we had built a strong community where the students felt safe to ask questions, point out personal mistakes, and make corrections. The students also felt comfortable asking each other questions about the technology that was being used, according to their surveys (See Appendix B). Some students were very familiar with iPads, while others were not. The questions and answering with the iPads also fostered a strong community in our reading group.

## FINDINGS

The graph below shows the students' comprehension skills improved during this research (See Graph). There was a dramatic increase in Fountas and Pinnell scores for the students Allie, Carson, and Tianna over the course of this study. This indicates that students comprehension levels increased as a result of the intervention. These three students participated in seven sessions, and their reading scores jumped four to five levels, placing them on a third grade reading level. The host teacher tested the reading scores of the students and found positive results after seven visits. Caron's reading level jumped from a Level J to a Level N. Alli's reading level jumped from a Level J to a Level O. Tianna's reading level jumped from a Level I to a Level N. Roger, Louis, and Alex's reading levels all remain on the border between Level J and K. This indicated a moderate increase in their comprehension levels. The students also noted in their surveys (See Appendix B) that they believed that reading on the iPads helped them understand the books better.



Student's Comprehension Scores on First Assessment after Reading

The students' engagement increased during this study as well. The iPads served as great tools with ample features to get students excited about reading. The students were able to pick the text that we read for each session. I believe this encouraged engagement during our sessions since the students were able to choose the readings. The students stayed engaged by making personal connections throughout their readings. The students in the small groups did not have behavioral issues during our session. While I cannot connect good behavior to using the iPads, I believe the iPads helped the students remain focused and engaged on the text.

Through their increased engagement, readers became more self-aware. Both Roger and Zach grew in their engagement in reading as their comprehension scores grew. For example, Roger began to recognize when he read too quickly, he did not comprehend the text. Both of these students realized when their pacing needed to be slowed during a session, or when they felt like they could be challenged with reading a more difficult text.

As the comprehension scores grew, the students' motivation towards reading grew dramatically. They worked on sounding out words by themselves before asking for help, and they also became more engaged with the text by asking questions, making connections, and making inferences. The students' motivation, as well as their confidence as a whole, grew during the sessions, as they comprehended the readings. When students remain engaged and motivated to read, they become more self-aware and their comprehension skills will increase.

## FUTURE PLANS

After completing this study, I learned valuable information that will affect the way I incorporate technology into my own classroom. Technology served as a beneficial tool to get students engaged and motivated to read. I would have liked to start this study at the very beginning of the school year and continue it to the very end of the school year to track the changes. I also would have liked to have longer sessions with the groups. Instead of previewing, reading, and taking the assessment on the same day, I would have liked to spread it out over a few days. It would be interesting to work with the students for a full year for more than one session a day to see the growth during a more intensive study. I think it would be interesting to extend this study with those students as they progress into fourth grade. Since the technology is new, different, and exciting for the students this school year, I think it would be interesting to see if the technology loses its' exciting value from year to year.



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## APPENDIX A



Raz Kids application-Book and Assessment:

Thanksgiving the Jacks Built, The       1     2     3     4     5     Pone	Ŷ
What does the mother do to prepare for Thanksgiving?	
A She goes to the store.	
B She rides her bicycle.	
C She cooks the turkey.	

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## APPENDIX B

Surveys:

Questions:

- 1. Did you like reading on the iPads more than you liked reading a physical book? Why?
- 2. Do you think reading books on the iPads help you understand the book more? Why?
- 3. Did you like reading as a group with the iPads, or would you want to do it one-on-one with a teacher?
- 4. Is there anything you would have changed about the guided reading on the iPads with me?

Allie:

- 1. I like reading on the iPad because it has more important stuff on it, and it gives us more information. It gives more words to learn.
- 2. Yes, it makes me understand the books and it is more interesting. It gives me more stuff to understand and it important stuff on the iPads.
- 3. I will like to do it one-on-one with the teacher because it is more quiet. It will be easier to read right.
- 4. I would like to go to the higher level of books. Sometimes the books are too easy for me so I think we should go to a harder level.

Carson:

- 1. Yes, because I like the pictures and facts on the pages.
- 2. Yes, because it defines the word if you do not know it.
- 3. I like to read with the group better.
- 4. No. I liked it.

Tianna:

- 1. I like reading on the iPads better than an actual book because the iPads can zoom in to words and define them.
- 2. Maybe, not really. I liked using them more.
- 3. I would like to do it as a group.
- 4. No. I liked it.

Roger:

- 1. Yes, because every time you are on the page you can't skip the words you don't know how to say. It keeps you on each sentence without letting you get ahead. I also like reading on the computer better than a book.
- 2. Yes, because when you're reading a hard copy book it doesn't tell you more about the title and words. The iPad tells



you more and defines them.

- 3. I liked it in the groups because you don't have to read all the pages. You can take breaks, if you have a long book.
- 4. No, I liked the group, but I would have liked to read different books. Everybody got to choose a book to read but sometimes I did not like the books they chose. I liked the books where they did the same stuff as me. Louis:
- 1. I like the iPads better, it helps you understand more. I like the colors and pictures.
- 2. Yes, it helps me understand more. It helps you read clearly, when I read chapter books it has bigger spaces and helps me see it better
- 3. I liked reading with the group, I liked hearing everyone else read the book too.
- 4. Wanted more sessions with you. I liked the books we read, I wish we could've read more. Zach:
- 1. Yeah, RAZ kids, liked listening to the book too.
- 2. Yeah, I like the device more than the book. I liked how we can go back and check answers in the ebook. I liked taking the quizzes on the iPad better than paper.
- 3. I would rather do it one-on-one, I like just the teacher and me. Sometimes the others weren't listening.
- 4. Yes, I wanted to read more books.


# The Employment of Internet System for Faculty Members at Tafila Technical University

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# ABSTRACT

The study aimed to identify the extent to which the internet System for Faculty Members at Tafila Technical University. The study sample consisted of 145 faculty members at Tafila Technical University. they were selected in a random sample manner, The researcher used a questionnaire divided into three main areas: teaching activities, scientific research, and motivation for learning, the results showed that the employment of internet Systems for Faculty Members at Tafila Technical University was a medium degree. It was also found that there were statistically significant differences due to the college and academic rank in favor of associate professor and humanitarian faculties, whereas no significant differences due to years of experience variable, the researcher recommended to encourage educational techniques in teaching and interested in employing the Internet system in Higher Education Institutions.

# INTRODUCTION

Scientific advances and technological change are now key to improving economic performance and social well-being, where education providers are unable to meet educational institutions in the era of technological skills, especially in the fields of preparing and training human resources and improving the outcomes of the education process (Champan, 2006). Educational technology is a systematic and organized process of applying modern technology to improve the quality of education and a method to solve problems as well as a systematic process included Symmetric elements in Hardware and machinery, ideas and opinions, methods of work, management, in addition to the human element, led to new variables in the educational field (Ajlouni, 2014 Mackes, 2004, Goodison, 2001). In view of the great changes taking place in the world at present, Internet use has become inDifferent fields of knowledge are essential to keep pace with these developments, especially in the fieldEducational level in all its dimensions, be it academic or practical aspects of the educational process, noEspecially that the Conference of influential forces in technology education held in (Houston, America), has been confirmed inHis recommendations included the need to introduce the Internet into the lecture halls, and to train faculty members in Universities, educators in the mainstream education process, the preparation of programs commensurate with technological development(Mansur, 2004). The Internet provides higher benefits and research services through which the faculty member can access the global libraries and access the intellectual output of scientists and researchers at his university. The Internet has a huge repository containing books, scientific papers, data, lectures and audio recordings Giving users an enormous amount of knowledge that is difficult to imagine. The Internet as one of the world's leading technologies in the international information network has created a new cry in the amount of information provided to human beings at lower cost, shorter time and greater achievement. And has become very attractive among all categories of users because of the services produced by them such as email, file transfer (FTP), the World Wide Web (WWW), news and specialized groups (U se net), virtual reality applications (Virtual) (E.commerce), and online telephone contact is increasing day by day, the presence of the sites of "distance education" of power and importance, on the Internet, if still the most important and fun in that area, is the use of virtual campus (Virtual Compus) Why This campus achieves a real interaction with the students, whether through the field It is not only limited to universities and training institutes, but has been developed to reach many software and application companies, with the aim of expanding the environment of their programs by working on Identify and train site visitors to use their products (Barakat, 2012, Ibrahim, 2004)

Castaño & Duart (2015) mentions the most important uses of the Internet in educational science in terms of interactivity and the achievement of interesting dimensions in image, sound and free synchronization, which lead to the motivation of students towards different learning situations, which improves learning outcomes that are rich in built-in knowledge. The use of the Internet in the teachings helps to improve the languages and identify the languages of different peoples, which helps students and teachers to learn new language either through written or audio communication, and undoubtedly, the use of The Internet in Education has made the teachers planners, academic guides and coordinators of the various teaching processes.



The student has become a researcher of information and a participant in the learning processes, thus facilitating the optimal use of improving the quality of web-based education (2016 & Randall Tayo). For faculty members, it is necessary to share knowledge and leadership in scientific and global openness and exchange of training and quality plans that focus on modernity and development in both academic and professional situations (Carr, 2016) Starr (1997, Starr) defined it as a global communications network that allows the exchange of information between smaller networks through which computers communicate around the world operating according to specific systems known as the unified protocol, an Internet protocol. The word "Internet" (Kinnaman & Dyrli, 1996). Here, the Internet Protocol (IP), known as the Internet Charter, is the Internet layer protocol responsible for carrying data generated by almost all the protocols of the Internet Protocol (IP) TCP / IP and other) of The source of the system until its destination Alnhaiah.ho (connectionless) protocol provides two of the most important functions of the protocol stack (TCP / IPP) and are addressing and routing and provides other functions such as the discovery of errors (1997 Trentin),. Laurie (1997) states that it is a global network of computer connections that allows people to connect and communicate with one another and to acquire and transmit information from the worldwide network through written, visual, audio and text devices beyond time, space, cost and distance constraints while simultaneously challenging control Bernard Barnard (1997) defines the Internet as an international network of information that uses protocols and cooperates with each other for the benefit of all its users, and contains many possibilities such as e-mail, inter-personal audio communication, video conferencing And mailing lists in addition to millions of news and press analyzes, and many of the files available for transfer and use in a personal way (Wikipedia TM).

In addition, the introduction of Internet technologies in the educational process has had a profound impact on the events of a qualitative shift and a radical transformation of the nature of the tasks and duties of the faculty member. By adapting these techniques to the theory of constructional education, the role of the university teacher is no longer limited to " And he is also a facilitator of the educational process, a facilitator, an academic advisor, a collaborator with his students and colleagues in the profession, and a specialist in the process of assessing the level of achievement. father And the other responsibilities that contribute to the success of the educational process and necessitated the effective applications of these techniques in the educational process, whether education, traditionally or electronically through the technology of the Internet the need to acquire faculty members in universities and colleges certain skills and experiences, to deal positively with those technologies, In the course of continuing education programs and courses that ensure their follow-up to rapid developments, which undoubtedly helps them achieve the constructive employment of Internet services in the educational process (Ali, 2009, Park, 2005, Monthly, 2004).

The faculty member is one of the main components of the higher education system in order to activate this role. Based on the degree of qualification and scientific and professional abilities in the performance of the basic functions in this system of teaching and scientific research and the service of a society depends on the prestige and academic reputation of the academic institution to which it belongs. In this context, educators and specialists in the curriculum and teaching methods agree that the success of the university professor in his performance depends on two main things: his distinguished scientific qualifications and his scientific specialization; second, his knowledge of educational theories and practices related to learning and teaching processes, Mohammed, 2008 Lei, 2007, the pristine 2001 (.

His Majesty King Abdullah II was keen on introducing technology and its uses into our educational institutions, students, teachers and administrators. After many teachers passed ICDL, it became useful to employ computer skills in teaching in the classroom. Which enables teachers and students to pass computer illiteracy, moves the teacher to employ skills and integrates technology with curricula; to improve student learning, to raise their level of learning, and to teach to an advanced degree that develops and enriches their higher-order thinking skills. (Toukan, 2002).

The access to the Internet in Jordan, with all provided information and applications are indispensable in our modern world, a quantum leap of civilization great. There is no doubt that this shift with the benefits of multiple benefits in all cultural and educational fields (mouse, 2002). A global company introduced the Internet service in Jordan in late 1995, after which the National Information Center began to provide this service and to provide the public sector and public and private universities (Al-Amri, 2005).

Based on the Kingdom's belief in the need to use the computer to develop the educational process, which is the basis of national development to achieve development goals, and to prepare future generations to meet contemporary challenges, the "Internet Access Project to Jordanian Schools", directed to the general education sector at all stages of education, In 2002, some schools were linked to an Internet pilot. Twelve schools were connected that year and increased to 100 schools the following year, supported by the Queen Rania Center for Teaching and Curriculum through the Internet.



The aim of this project is to provide students with the opportunity to teach computers through a central network called the Internet on the curricula within schools. The schools were then connected to the Internet to develop the skills of students and prepare them well for future requirements, To be the nucleus of the technology industry The educational literature on the Internet system is closely related to the subject of this study, most notably the Seirup & Tirotta & Blue, 2016 study aimed at understanding the perceptions of faculty members and graduate students of the Internet system compared to traditional learning in middle schools in the Northeast of the United States, researchers used the descriptive analytical tool, where the study was a questionnaire composed of four areas of expertise in the use of online teaching methods, challenges and difficulties, scientific research, the results of the study showed that the teaching methods based on the internet better way Direct learning, while the area of expertise of the faculty member who uses the Internet the second area of the preference of the use of normal or direct, and appeared in the third area of scientific research for faculty and students in terms of use, while the field of challenges and difficulties ranked fourth, internet in various scientific and education among students and teachers fields.

The study of Katz (Katz, 2016), which examined the use of high-tech touch or online learning, and higher education independent. Innovations in learning and education. The study was applied to independent colleges and universities in Washington State for undergraduate students. The study sample consisted of students using online learning, technology users as a pilot group, students using direct learning methods, and users of traditional methods of learning as a control group. preference between the two groups study results showed the existence of superiority in favor of the control group on account of the experimental group, the study warned in its result of the imbalance in the building and online learning To learn the traditional view of the lack of digital learning and direct higher learning costs. The study also recommended the need to conduct research among students via the Internet as a means more than other means between students and their supervisors interactive.

In Miller's study, in collaboration with the Pew Research Center, which examined the transition to online learning among students and professors of the University of Southern California, the study used the survey method as a research measure. The study sample consisted of 2492 students and faculty. that 94% of students and faculty members are using the search engine Google to conduct research more sources of information available at the university also study the evaluation of the skills and strategies of teaching have shown over the network and how to benefit in the future teaching and work to improve them as recommended by the study to be learning from Through the digital environment to ensure the success of students in their learning and take advantage of the various online sources.

The study of the dice (2015) aimed to find out the attitudes of the faculty members towards the use of the Internet in scientific research and teaching at the Faculty of Education, the University of Sana'a. The researcher used a questionnaire from his development to measure the attitudes of faculty members on gender variables, scientific rank and years of experience. scientific research, teaching, and limited sample of their e-mail or social networking site like (Facebook), totaling 39 individuals, revealed the results of the study the existence of positive trends among faculty members towards the Internet employ in the fields of scientific research, teaching, and the results showed the lack fled S statistical function towards the employment of the Internet in the fields of scientific research, teaching, due to the variables of the study.

Abu Anair also conducted Alsakarneh (2014) study to detect trends faculty at the University of Balqa Applied members towards the use of the Internet in education. The study population of all teaching staff at the University of Balqa Applied in all colleges and academic disciplines and ranks faculty members, has been developed a questionnaire consisting of (84) divided into three areas paragraph, and used appropriate statistical methods to analyze information. The results of the study showed that the attitudes of faculty members at the University of Al-Balqa Applied towards the use of the Internet in university education were very high and high in all fields of study. It also showed that there are obstacles facing faculty members at Al-Balqa Applied University in using the internet in university education but with a medium degree of importance . In light of the results of the study researchers presented a set of recommendations and proposals of the most important of the need to develop the administrative systems of the Jordanian universities in order to turn communicate with faculty members continue to a traditional electronic communication across the Web and the Internet information network.

Junaid and also conducted vertical (2014) study to determine the obstacles faced by the students of the Internet Department of Mathematics, Faculty of Education, University of Aden, as well as knowledge of the degree of constraints depending on the school level, and the use of sex. The study sample consisted of 181 students from the four levels of study in the Department of Mathematics. The researcher used a questionnaire that included three main areas. The study showed that the statistical averages of the three obstacles ranged between 1.51-2.31 according to the relative rank of each handicapped



The learning disability ranked first with an average of 2.31. With an average of 1.51. The study also showed that there were statistically significant differences among the third and first level students about the handicap of self potential for the first level students. A T-test was also used to indicate that there were no statistically significant differences in the three areas between males and females. In the study of solubility.

## The problem of the study and its questions

Tafila Technical University is one of the distinguished universities that introduced the internet system to the university space with all its modernity and its educational components. It developed the websites that belong to the faculty members and students, established computer labs, held programs and training courses for this subject and provided the material and technical resources for the success of the internet system. Is a prominent feature of the technical character differently from other universities, for the development and improvement adopted by the University, but noted through the researcher's experience of university reality, especially for faculty members that there Images in the use of the Internet The dominant methods of teaching at the university is to teach the traditional knowledge of the availability of the university services of high quality to receive education through advanced scientific and advanced way of life, in addition to a lack of a positive trend of the network, which is due to lack of knowledge of the members of the teaching staff how to run Devices and equipment for this purpose, taking into account also the non-employment of Internet services by faculty members in their scientific research of the global databases shared by the university and access to recent studies and other technological innovations, and On the basis of the interviews conducted by the researcher with the faculty members, he felt the existence of relative views towards the employment cases of the Internet system. To examine these factors, the study problem focused on the knowledge of the extent of the Internet system employed by faculty members at Tafileh Technical University. On the following questions:

1 - How well is the Internet system employed by faculty members at Tafileh Technical University?

1. Are there any statistically significant differences at the level of significance ( $\alpha 0.05$ ) among faculty members due to the variables (academic grade, years of experience, and college)?

Purpose of the study

The aim of the study was to find out the extent of the use of the internet system among faculty members at Tafileh Technical University

## The importance of studying

The importance of the current study stems from the recent developments in scientific and technological progress, and Jordan occupies a prominent place in the technical interest. The Hashemite Kingdom of Jordan has established all its energy and educational policy towards a society based on information technology. The establishment of educational institutions, including the Higher Education Foundation, which directed Jordanian universities towards e-learning, and the use of modern means to keep pace with scientific explosions, and the rapid increase in the heritage of knowledge, and focused attention to members of bodies To teach and students to improve technological abilities and skills through the holding of programs, training courses, how to employ them within the educational institution, not to mention the advancement of scientific research through the use of the Internet system in the academic form, to reflect the civilizational aspect of the institution belonging to the faculty member, This institution is a milestone among the other institutions. The university teacher has achieved the importance of teaching and scientific research in the best ways and means of technology, and benefiting from all forms of technology in his scientific and practical life, and highlights the importance of this study as paving the way for For researchers in the future to carry out other field studies related to the Internet system in the light of other variables.

#### The limits of the study

The limits of the study were limited to the following:

Timetable: The study was applied in the second semester (2016-2017).

Spatial determinants: The study was limited to faculty members at Tafila Technical University only.

#### Definitions

The extent of Internet recruitment: The sample of the study sample of faculty members at Tafila Technical University of the Internet when responding to the study tool.

Faculty members: They are the members of the academic faculty at Tafila Technical University interested in the study of the rank of (professor, associate professor, assistant professor or full-time lecturer).



The Internet: The global network through which the individual can connect and communicate through modern methods and means of information and other technological communities.

Methodology and procedures of the study

# METHODOLOGY OF THE STUDY

An analytical descriptive approach was adopted which deals with the extent of the use of the internet system among faculty members at Tafileh Technical University. The same methodology was followed in preparing a questionnaire to identify the responses of faculty members at Tafileh Technical University.

#### **Study Society**

The study population is composed of all (237) members of the teaching staff at Tafila Technical University for the academic year (202016-2017), according to the Human Resources Department at Tafila Technical University

#### The study sample

The sample of the study consisted of (145) members, randomly selected from among the different disciplines, constituting (%) of the study population, randomly selected from the study community. After the questionnaire was distributed and retrieved, , The number of sample members as mentioned in Table (1). Table (1) shows the distribution of sample members according to personal and functional variables

variable	Category	Repetition	p.c.
	Professor Doctor	6	4.1
A andomia Dank	Associate professor	40	27.6
Academic Kank	Associate Professor	55	37.9
	Full Time Lecturer	44	30.3
Callege	Scientific	64	44.1
College	Humanity	81	55.9
	Less than 5 years	25	17.2
years of experience	More than 5 years	120	82.8
total		145	100

Table (1): Distribution of sample members according to personal and functional variables

Table (1) shows the following:- As for the scientific rank variable, we notice that the members of the scientific rank of the most frequent assistant professor, which reached (55) percentage (37.9%), while the members of the academic staff ranked by the least frequent professor who reached (6) and percentage (4.1%).- As for the college variable, we note that the faculty members of the humanitarian colleges are the most frequent, which reached (81) percentage (55.9%), while the members of the scientific colleges are the least frequent, which reached (64) and percentage (44.1%).- As for the variable of teaching experience, we notice that the teaching staff with more than 5 years of teaching experience is the most frequent, which reached (25) percentage points (17.2%), while the teaching staff with less than 5 years experience is the least repetition which reached (25) C (17.2%).



## Study tool

The researcher built and designed a questionnaire as a tool to study the extent of the use of the Internet system among faculty members at Tafileh Technical University after reviewing the theoretical literature and previous studies (Al-Dais, 2015, Abu-Anfair and Al-Sakarna, 2014, Al-Junaid and Al-Amoudi, 2014, Omari, 2009). (1), (2), strongly opposed (1), (2), (2), (2) ).

#### Believe the tool

(20) arbitrators of specialists and experienced members of the faculty of Yarmouk University, Mu'tah University and Hussein bin Talal, and based on their observations was modified the wording of some paragraphs in terms of construction and language, And the clarity of the paragraphs and the correct scientific methodological treatment, and any observations they see appropriate where the observation was taken, and was deleted (15) paragraph, and thus became the study tool consists of (75) paragraph.

#### Stability of the tool

To ascertain the stability of the tool, the researcher applied it to a survey sample outside the sample of the study (30) faculty members twice, and a time interval of two weeks between the first application and the second application. Pearson correlation coefficient was calculated between the results of the two applications of the total scale (0.88). The coefficient of homogeneity stability was calculated by Kronbach Alpha method (0.86). An acceptable proportion for conducting this study.

#### **Study procedures**

First, the researcher conducted a comprehensive review of the principles of the Internet system in terms of analysis, planning, development, implementation and implementation, in order to develop a holistic vision to write paragraphs of the questionnaire, relying on the correct scientific methods to reach reliable results and achieve the objectives of the study.

Second: The researcher held interviews with faculty members and identified the most important difficulties and obstacles to academic and technical in order to obtain a scientific methodology correct.

Thirdly, the researcher conducted interviews with students about the Internet system and the various methods they face and to identify the recruitment in terms of teaching methods and methods used in the implementation of the lecture.

Fourth: Holding training workshops for the use of the Internet system included a sample of faculty members and students so that the researcher to develop a final vision to write paragraphs of the questionnaire.

The researcher reviewed the most important studies related to the subject of the study, including: Seirup & Tirotta & Blue, 2016 Miller, 2015, 2009, Oksana & Doris, Al-Dais, 2015, Abu Anfair and Al-Sakarna, 2014, Al-Junaid and Al-Amoudi, 2014, Al-Omari, 2009

Sixth: The researcher wrote the paragraphs of the study tool in its final form, relying on the above, taking into account the honesty and consistency of the study.

Seventh: The researcher distributed the study tool on a survey sample outside the sample of the study (30) faculty members twice, and a time interval of two weeks between the first application and the second application.

Eighth: The researcher took the approval of the deans of the colleges to conduct the study in accordance with the regulations and instructions in force at Tafila Technical University.

Ninth: The questionnaire was distributed to the faculty members taking into account the full compliance with the information set on the study tool and explanations in order to answer easily and clearly.

Tenth: The questionnaires were collected and then the researcher emptied the data using the SPSS program for the proper analysis of the study.

#### Study variables

The study included the following variables:

First: Independent variables Academic rank: It has four levels: (Professor, Associate Professor, Assistant Professor, Full Lecturer). Years of academic experience: It has two levels: (less than 5 years, 5 years and over). College: It has two levels: (scientific, human).

#### Second: dependent variable:

The extent of the use of the Internet system among faculty members at Tafileh Technical University. It is expressed in the arithmetic mean of the estimates of the sample members on the employment scale sections that were designed for this study.



## Statistical processing

The results were subtracted, the SPSS program was used to analyze the data, and the arithmetical averages, standard deviations, and degree of approval were calculated for each of the instrument sections and instrument as a whole. The approval is as follows: strongly agree (5), OK (4), neutral (3), exhibits (2), strongly opposed (1).

# View and discuss results

First: Results related to the first question and discussed:

The first question was: "To what extent is the Internet system used by faculty members at Tafila Technical University?" To answer the first question, the computational and standard deviations of each paragraph were calculated for each and every dimension as a whole. The Internet has a faculty member in Tafileh Technical University and each dimension of the following: (Teaching activities, scientific research, motivation for learning), where the results are shown in tables (2, 3, 4, 5).

Table (2): The arithmetical averages and standard deviations of the dimensions of the extent of the use of the Internet system among the faculty members of Tafileh Technical University are arranged in descending order

The dimension	Average Arithme tic	standard deviation	dgree
Motivation to learn Teaching activities	3.61	0.30	Medium Medium Medium
	3.42	0.52	
	3.28	0.56	
The extent of the Internet system as a whole	3.44	0.27	Medium

Table (2) shows that the calculation averages for the Internet use of Tafileh's faculty members ranged from 3.28 to 3.61, above was "Scientific Research" with an average of 3.61 and an intermediate grade, followed by "motivation" (3.42) and intermediate level, while the mean averages for the "teaching activities" average (3.3228) and the average score for the "Internet use of faculty members in Tafileh Technical University" (3.44) And to a medium extent.

Paragra	ph	Average Arithme tic	standa rd deviati on
		3.84	0.76
		3.82	0.83
		3.60	0.90
		3.57	0.80
		3.46	0.85
		3.43	0.92
 		3.42	0.81
 		3.41	0.85
 		3.40	0.94
		3.39	0.79





ability to converse and dialogue.

I use the Internet because the information is correct, reliable.

Explain the educational attitudes of

students through the Internet. I design goals for the materials I teach

through the web.

I present the material plans that I teach to students through the web.

The most modern methods of teaching in my theoretical and applied lectures through the web.

Teaching through the Internet saves me time and effort more than traditional teaching.

The Internet makes students more fun and more motivated than traditional in teaching.

Internet service provider for the purpose of searching for information that benefits students.

The Internet adds a wide range of educational experiences to enrich the knowledge content I teach.

The method of interaction between me and students through the Internet system.

The materials I study are planned through the Internet because they are modern and knowledge-based.

The Internet factor regulating and adjusting the educational position is more than the traditional attitude of teaching.

I do not use the Internet because it is



expensive and needs more time and	-		
effort to collect the information.			
The field of employing the Internet			
system in teaching activities			

Table (3) shows that the calculation averages for the extent of using the internet system in the teaching activities of faculty members at Tafileh Technical University ranged between (2.27-3.60). The paragraph that states "normal teaching is better than teaching online for teaching materials" The first with an average of 3.60 and a middle class. Finally, the paragraph states, "I do not use the Internet because it is expensive and needs more time and effort to collect the information." With an average of 3.27 and an average score of 3.28 and an average score of (3.28) for the utilization of the internet system in the teaching activities of the faculty members of Tafila Technical University as a whole.

The field of employing the Internet system in scientific research Table (4): The arithmetic averages and the standard deviations of the paragraphs related to the averages of the extent of the use of the Internet system in the scientific research of the faculty members ranked in descending order

Paragraph	Average	standa
	Arithme tic	ra deviati
		on

Subscribe to the online databases.	3.92	0.59
Provide tips and advice to researchers on how to write scientific	2 97	0.50
research through the Internet.	5.07	0.39
E - mail services.	3.87	0.63
I follow every new thing in the development of scientific research,		
taking advantage of everything that is available in the internet of	3.86	0.60
originality and modernity.		
Publish my scientific research through the websites provided by	2 95	0.50
the network.	5.85	0.50
I have developed an integrated encyclopedia through the expertise	2.95	0.63
of the Internet in the fields of research in my specialization.	5.85	0.05
Through the Internet I can see the results of the arbitration of my	2.94	0.57
scientific research and monitor the results.	5.84	0.57
My correspondents are to discuss scientific research through the	2.92	0.50
web.	5.85	0.39
The Internet promotes scientific research and distinguishes it from	2.91	0.56
other sources.	5.01	0.30
In my scientific research, I relied on specialized links provided by	2 77	0.60
the Internet with a monthly subscription.	5.77	0.09
I guide my students in writing their scientific research through the	2 77	0.60
internet system.	5.77	0.00
Employing the Internet in scientific research saves both time and	3 72	0.50
effort	5.12	0.59
Internet services provider to attend global and local conferences	3.71	0.62
The Internet is developing my research skills and making use of	2.60	0.66
sites and links to write good scientific research.	3.09	0.00
Subscribe with other colleagues through online writing scientific	3.68	0.72
research.	3.00	0.72

The Web Application Cleaner is a complete computation of my scientific research.	3.64	0.72
Internet recruitment has become a necessity for obtaining research information for all faculty members.	3.64	0.79
I draw my colleagues and my students to write good scientific research through the internet.	3.61	0.88
Clean up all available search engines on the web to write my scientific research.	3.54	0.81
Writing scientific research in normal ways is better than going back to the internet as a sound research system.	3.50	0.86
I rely solely on my personal computer for online messaging and transfers in my scientific research.	3.43	0.90
I feel that information through the Internet does not give the correct scientific accuracy like other traditional sources.	3.43	0.93
I find it difficult to find information through the internet.	2.99	0.99
The references and resources in my scientific research are only done through the Internet.	2.77	0.82
I feel that using the Internet to write scientific research is a waste of both time and effort.	2.33	0.91
Medium	3.61	0.30

Table (4) shows that the calculation averages for the utilization of the Internet system in scientific research among faculty members at Tafileh Technical University ranged between (2.77-3.92). The paragraph which states "subscribe to the database service available on the Internet" The first with an average of (3.92) and a high score, and lastly the paragraph that states "I feel that the use of the Internet in writing scientific research is a waste of time and effort together." With an average score of (2.33) and a medium degree. The mean of the utilization of the Internet system in scientific research among the faculty members of Tafileh Technical The field of employing the Internet system with motivation to learn Table (5): The arithmetic averages and the standard deviations of the paragraphs related to the extent of the use of the internet system by motivation among the faculty members of Tafileh Technical University

Direct interaction is better than using the Internet in university	3.83	.97
teaching.	3.72	00.94
Employment for Internet applications in academic work Save the	3.69	0.82
effort and fatigue and go to the library.	3.69	0.99
Learn about the educational experiences that specialize in my	3.57	0.91
specialization through the web.	3.55	0.90
I think that the Internet has changed my academic path toward the	3.54	0.00
better.	5.54	0.99
I want my work in teaching to be related to using the Internet.	3.53	0.99
The best specialized research sites provided by the network than	3.51	0.98
the common sites on other search engines	3.48	0.90
I think that using the Internet in university teaching is an urgent	3.46	0.93
need for improvement and development.	3.46	0.93
I think of the superiority of the Internet as an educational tool than	3.45	0.98
other technological means.	3.42	0.96
I believe that employing the Internet achieves positive interaction	3.40	0.97
and contributes to serious discussions among researchers.	3.38	0.98
I appreciate and appreciate the role played by the Internet in both	2.24	0.09
scientific and practical life.	3.34	0.98
I carry out all my research and teaching work through the	3.33	0.93
electronic system	3.29	0.98
I see that using the Internet encourages the day-to-day teacher to	3.28	0.96



follow his students.	3.26	0.93
I feel uncomfortable when there are mechanical or mechanical	3.21	0.93
difficulties and distortions that lead to practical disruptions to	3.18	0.98
Internet uses.	3.10	0.96
I would like to use my colleagues and students of the Internet	2.26	0.91
system in university teaching.	2:20	0.91
I see that the use of the Internet in scientific and practical		
applications has changed teaching systems towards creation and		
innovation.		
I would like to participate in training courses to help me learn how		
to use the Internet.		
I feel the presence of the Internet in the university space is very		
active and lasting for students and faculty members.		
I feel fun and useful when I use the Internet because it brings me		
motivation and success in my education.		
I love reading the published research on the Internet.		
I want to communicate with others through the Internet.	3.42	0.52
I achieve my educational goals and the most teaching materials		
through the employment of the Internet services provider and its		
educational applications.		
I feel confident in myself when teaching the Internet more than the		
traditional ways of learning situations.		
I see that using the Internet is a waste of time and effort.		
I think there are difficulties and challenges when using the Internet		
by students and teachers alike.		
I feel lonely and unbalanced when I use the Internet		
The field of employing the internet system with motivation to		
learn		

The table shows (5) that the arithmetic averages for the approval of the sample paragraphs concerning the extent to employ online system motivation for learning among faculty members at the University of Technology Tafeileh ranged between (2.26-3.83), where the paragraph which states that "direct interaction better than the use of the Internet came in university teaching "ranked first with a mean (3.83) and a high degree, and ranked the last paragraph that the" I feel lonely and unbalance knowledge when I use the internet, "an arithmetic mean (2.26) and moderately, and the arithmetic average of the extent of employing online system motivation for learning among faculty members The Dries at the University of Technology Tafeileh as a whole (3:42) and a medium degree.

Results related to the second question: "Are there any statistically significant differences at the level of significance ( $\alpha 0.05$ ) among faculty members due to the variables (college, years of experience, academic level)?"

In order to answer the second question, the computation and standard deviations of the extent of Internet recruitment among faculty members at Tafila Technical University were derived from their point of view due to the college, years of experience, and academic level.

Table (6): The computational environment and the standard deviations of the extent of internet employment among faculty members at Tafileh Technical University are attributed to the overall variables, years of experience and academic rank



	Variable levels of statistical	College of Science	Standard Deviation 0.44 0.33
	variable Teaching activities		0.47 0.35
	Scientific research motivation		
	to learn the recruitment of the		
	Internet system as a whole		
Humanized arithmetic average	Standard Deviation 0.63 0.29	Years of experience Less than	Standard Deviation 0.33 0.30
3.50 3.74 3.60 3.61	0.43 0.37	5 years Arithmetic mean 2.91	0.44 0.32
		3.35 3.18 3.15	
More than 5 years Arithmetic	Standard deviation 0.57 0.31	Academic Rank Professor of	Standard Deviation 0.15 0.41
average 3.35 3.67 3.47 3.50	0.47 0.38	Arithmetic mean 2.95 3.38	0.51 0.30
		3.35 3.23	
Associate Professor The	Standard Deviation 0.60 0.27	Assistant Professor The	Standard Deviation 0.46 0.20
arithmetic average 3.75 3.88	0.36 0.29	arithmetical average 3.25 3.62	0.35 0.27
3.83 3.82		3.38 3.42	
Full-time lecturer. The	Standard Deviation 0.32 0.32		
arithmetical average 2.91 3.38	0.45 0.31		
3.10 3.13			

The above table shows that there are apparent differences between the average responses of the sample of the study sample in all dimensions of the Internet system, namely (teaching activities, scientific research and motivation for learning) according to the variables (college, years of experience and academic level). Analysis of the three-dimensional variance on all dimensions of the Internet system employed by faculty members at Tafileh Technical University. Table (7) shows this.

Table (7): Results of the analysis of the three-dimensional variance to detect the differences in the dimensions of the employment of the Internet system according to variables (total, years of experience, academic level)

Change the	the college	Hotelling =	H = 0.005	Scientific	The motivation	Years of
dimension Total		0.099	Instructional	Research 0.535	for learning	Experience
squares			activities 1.751	1 0.535 7.719	0.982 1 0.982	
Freedom			1 1.751 8.545	0.006	6.660 0.011	
degrees Mean			0.004			
squares Value						
"F" Statistical						
significance						
Hotelling =	H = 0.230	Scientific	Motivation for	Academic level	Wilkes = .6100	H = 0.000
0.032	Teaching	Research 0.127	learning 0.148 1			Teaching
	activities 0.058	1 0.127 1.831	0.148 1.004			activities 8.990
	1 0.058 0.283	0.178	0.318			3 2.997 14.627
	0.595					0.000
Scientific	Motivation to	Teaching	Research 9.636	Motivation to	Total Corrected	Scientific
Research 2.907	learn	activities		learn	Teaching	Research
3 0.969 13.978					activities	
0.000						
Motivation to						
learn						

Table (7) shows:

- There are differences of statistical significance in the dimensions (teaching activities, scientific research, motivation to learn) depending on the variable college, and the differences came in favor of the human college in all these dimensions.

- There are statistically significant differences in the dimensions (teaching activities, scientific research, motivational learning) according to the academic level variable, and to discover the fundamental differences between the computational settings using the Schiffe test of multiple dimension comparisons, and Table 9 illustrates this.



- There were no statistically significant differences in the dimensions (teaching activities, scientific research, motivation to learn) according to the variable years of experience, where F did not reach the level of statistical significance.

The analysis of the triangular variance was also applied to detect differences in the extent to which the Internet system was used by the members of the faculty at the Technical College as a whole according to the variables (total, years of experience, academic level). Table 8 shows this.

Table (8): The results of the analysis of the triangular variance to detect the differences in the extent of the use of the internet system among the members of the faculty of technical education as a whole according to the variables (college, years of experience, academic level)

Variable Total squares	College 1.031 1 1.031	Years of Experience	Academic level 6.161 3	Error
Freedom degrees Mean	13.451 0.000	0.005 1 0.005 0.065	2.054 26.805 0.000	
squares The value "F"		0.798		
denotes the statistical F				
Total corrected				

There were statistically significant differences in the level of the Internet system as a whole according to the college variable. The differences were in favor of the members of the human college. The mean of the members of the human college was 3.61.

- There are statistically significant differences in the extent of the use of the Internet system as a whole according to the academic level variable, and to discover the fundamental differences between the computational computation using the Schiffe test for the post-comparisons, and Table (9).

- There were no statistically significant differences in the extent of the Internet system as a whole according to the variable years of experience, where the value of "F" did not reach the level of statistical significance.

Table (9): Results of applying the Scheffe test for post-comparisons between the SAICM calculation averages according to the age variable

Associate	The	Teaching	Associate	Assistant	Full time	Academic	Arithmetic	Scientific
Professor	arithmetical	Activities	Professor	Professor	lecturer	Rank	average	Research
Assistant	average is	Professor	3.75 0.5 *	3.25 -0.3		Professor	3.38 3.88	Professor
Professor	2.95 3.75		0.66 *			Associate	3.62 3.38	.338 -0.5 * -
Emeritus	3.25 2.91					Professor		0.24 0.00
Lecturer						Assistant		
						Professor		
						Full-time		
						Lecturer		
Associate	Assistant	Full Time	Professor	Academic	The	Associate	Assistant	Full time
Professor	Professor	Lecturer	Associate	average	motivation	Professor	Professor	lecturer
3.88 0.26	3.62 -0.24	3.38	Professor	3.35 3.83	for learning	3.83 0.45 *	3.38 0.28	3.10
0.5 *			Assistant	3.38 3.10	Professor	0.73 *		
			Professor		3.35 -0.48 *			
			Emeritus		-0.03 0.25			
			Lecturer					
Professor	Academic	Recruitment	Associate	Assistant	Full Time			
Associate	average	of the	Professor	Professor	Lecturer			
Professor		Internet	3.82 0.4 *	3.42 0.1				
Assistant		system as a	0.69 *					
Professor		whole.						
Emeritus		Professor						
Lecturer		3.23 -0.59 *						
		-0.19 0.1						

Table (9) shows the following:



- There are statistically significant differences in the extent to which the Internet system is used in teaching activities between the academic rank (associate professor) and the academic rank (professor, assistant professor, full time lecturer) for the academic rank (associate professor). ).

- There are statistically significant differences in the extent of the use of the internet system in scientific research between the academic rank (associate professor) and the academic rank (professor, full time lecturer) for the academic rank (associate professor).

- There are statistically significant differences in the extent of the use of the internet system in motivation for learning between the academic rank (associate professor) and the academic rank (professor, assistant professor, full time lecturer) for the academic rank (associate professor). ).

- There are statistically significant differences in the extent of the use of the internet system as a whole in scientific research between the academic rank (associate professor) and the academic rank (professor, assistant professor, full time lecturer) for the academic rank (associate professor). 3.82).

# Recommendations

After the completion of the procedures of this study, and in light of the findings of the researcher, it recommends the following:

- Encouraging faculty members to use the Internet system in their fields of specialization.
- Holding training courses for faculty members to enable them to activate and develop the use of the Internet system
- Conducting further studies on the methods of the Internet system in university education.

• Conducting similar studies on larger samples, including other educational institutions in the Hashemite Kingdom of Jordan, to disseminate the results.

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# The Future of Artificial Intelligence in Storytelling and Journalism

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# ABSTRACT

The question of major story arcs in the field of literature has been widely debated, with ancient scholars such as Aristotle and modern scholars such as Kurt Vonnegut arguing for the existence of major story arcs in storytelling. However, today with the advent of artificial intelligence and data mining algorithms, new perspectives on this very ancient question of major story arcs can be re-examined in order to shed light on how education will evolve in literature and journalism. This paper addresses the use of artificial intelligence to analyze stories in literature and journalism with special attention to data mining. Specifically, this project will be looking at the major stories arcs as identified by algorithms in order to show how stories arcs can be used to teach journalism. This paper will discuss the future trends in artificial intelligence will continue to play a larger role in education when it comes to the 21<sup>st</sup> century classroom and that educators must become familiar with this increased influence. In conclusion, this project, by closely examining the role of artificial intelligence in storytelling arcs, sheds new light on how literature and journalism will be taught in classrooms of the future.

# **INTRODUCTION**

"I writhed with joy, which I experienced for the first time, and kept writing with excitement. The day a computer wrote a novel. The computer, placing priority on the pursuit of its own joy, stopped working for humans" (Schiller, B., 2016).

A couple of sentences above are excerpts from "Konpyuta ga shosetsu wo kaku hi," or "The Day a Computer Writes a Novel" by an AI program at Future University Hakodate in Japan. This unusual piece of work had been recognized when it entered the writing contest for Hoshi Shinichi Literary Award. The novel was instantly noticed by officials and the public alike, for it was, despite having been written by artificial intelligence, astonishingly well-structured, grammatically correct, and well-balanced regarding plot and setting distribution. The book didn't win the final prize, due to several limitations – According to Big Think, a science fiction novelist commented on the book later at a conference, saying "I was surprised at the work because it was a well-structured novel. However, there are still some problems (to overcome) to win the prize, such as character descriptions." (Shoemaker, N. 2016). While the attempt did not bear its intended fruit entirely, it still shocked the world, not as much for its writing skills as for the sheer, somewhat disturbing fact that artificial intelligence has now come to the point in which it can create, an ability, which until now, had been recognizing as strictly human.

Artificial Intelligence's breakthrough in the field of storytelling signals the upcoming of a new chapter in even the history of AI itself. Sure, artificial intelligence has, in the past couple of decades of its rapid evolution, achieved feats that had only been dreamed by authors of science fiction novels and films. Deep learned systems in phones work as secretaries, while individually motivated devices help set the table, and autonomous drones complete with face recognition features guard the borders. In fact, artificial intelligence had even been put in charge of writing before. Automated Insights, an AI-powered article writer, produces stories from data according to algorithm-provided style and formatting guidelines. News Atlas claims that "Its AP news articles are dry and efficient in the same way as human-authored AP stories...Even including jokes and slang" (Moss, R. 2015).



Still, creative storytelling in artificial intelligence meets only shock, if not skepticism, almost every time it is revealed to the public. The biggest cause of the excitement is, presumably, similar with the perceived difference between artificial intelligence in journalism and creative storytelling: the notion that creativity has always been a sacred gift that only humans enjoyed since the birth of its existence. Another would be the conception that creativity is the exclusive property of the human soul. Dieter F. Uchtdorf had asserted that "The desire to create is one of the deepest yearnings of the human soul." Marilyn Monroe quoted "Creativity has got to start with humanity, and when you are a human being, you suffer; you're gay, you're sick, you're nervous or whatever." How blasphemously shocking that a machine that possesses nothing such as feeling nor emotion, let alone a soul may take humanity's mantle as a creator indeed! How could a computer write: "There was no one else in the world / There is no one else in sight / they were the only ones who mattered / they were the only ones left / he had to be with me / she had to be with him / I had to do this / I wanted to kill him / I started to cry / I turned to him." (Excerpt from "Generating Sentences from a Continuous Space, written by Google Brain Team's AI. May 12, 2016) when had it never felt any human emotions?

Perhaps the best explanation for this unusual achievement of intelligent machines lies in deep learning's design. The deep learning model consists of layers of interactive algorithms, which simultaneously classify intricate structures from the big data and make predictions over new input. In other words, the deep learning models are designed to act like the human brain, voraciously feeding off input data and utilizing them to further interact with the world. Research had first started primarily to expand the sphere of the practical utility of artificial intelligence. However, impressive modern progression in the modern era had led to researchers meddle further with its capability, feeding the deep learning model with literacy data and attempting to make it mimic human creativity and emotions. As a result, in 2008, artificial intelligence utilized the term "true love" in a variation of Leo Tolstoy's "Anna Karenina" and in 2013 an MIT digital media professor successfully coined an AI program that wrote "World Clock", which used lines of coded algorithms to arrange characters, locations, and actions.

Although most individuals are aware that artificial intelligence has now become astonishingly similar with the human brain, machines' feat to conceive works that surprising strike its readers with structured originality and dramatic devices is still mesmerizing to most. However, it is important to note while it may seem that literature does not have any particularly successful patterns or "money codes," there are, in fact, story shapes, or outlines that evoke more emotions and enjoyment than others. Kurt Vonnegut, a writer greatly acclaimed for his humor and prose, asserted that "stories have shapes which can be drawn on graph paper, and that is the shape of a given society's stories is at least as interesting as the shape of its pots or spearheads" (Jon Fusco,2016). He argued that most acclaimed stories fall within eight emotional arcs: Man in Hole, Boy Meets Girl, From Bad to Worse, Which Way is Up, Creating Story, Old Testament, New Testament and Cinderella. Although some assert that Vonnegut was half joking -as he did most of the time- when he stated his hypothesis, the "story shapes" theory have been graphed, taught, and even proved among computational analysis in 2016 (Figure 1.) by the Computational Story Lab at the University of Vermont in Burlington. In discussing Vonnegut's "story shapes," the participants within the lab concluded that "our ability to communicate relies in part on a shared emotional experience, with stories often following distinct emotional trajectories and forming patterns that are meaningful to us."





#### Figure 1.

(Retrieved from : http://nofilmschool.com/2016/11/emotional-arcs-6-storytelling-kurt-vonnegut)

Certain creative artists such as Jon Fusco, an American screenwriter, and producer, took this as proof "without a doubt, that Vonnegut and his thesis were correct." The AI's finding would serve as proof that stories can indeed be broken down into simple formulas. Granted in this stage the six templates found by the AI is rudimentary. It takes a look at the bigger picture in order to encompass stories into larger categories. However, the step taken by the AI is clear. Writing, something once thought to be sacred to man has become increasingly integrated into an algorithm that machinery and programs can understand.

Similar breakthroughs can be seen in the field of journalism. During the 2016 election, The Washing Post employed an advanced artificial intelligence technology under the name Heliograf. After its first debut during the Rio Olympics, Heliograf provided The Washington Post with "unprecedented level of election coverage" with "up-todate reporting, analysis, and results for nearly 500 races." (The Washington Post, October 19, 201). The program would stay consistently updated on the progress of the election and produce text that covered necessary events. Of course The Washington Post relied on human writers to edit Heliograf's articles and ensure the quality of content. As Jeremy Gilbert, director of strategy initiatives at the Post claimed "We have transformed Heliograf into a hybrid content management system that relies on machines and humans, distinguishing it from other technologies currently in use. This dual-touch capability allows The Post to create stories that are better than any automated system but more constantly updated than any human-written story could be."

Whether it is the more practical and rigid structure of a reported news article or a more artistic approach to writing that lies within novels and stories, these advances in AI usage foreshadow a movement of technological advancements in the field of creative writing. Christoph Thun-Hohenstein, Director of the Austrian Museum of Applied/Contemporary Art in Vienna, explained in his interview with Medium, "the system works in such a way that as soon as one company starts to go down this of partial-to-full automation, when technology permits it, all the other companies in the same field have to do the same. This is the law of the market."

#### LIMITATIONS

Though the possible application of artificial intelligence in the field of Journalism is endless, there is still a need to differentiate between the practical and impractical ways to program an artificial intelligence. For example, an AI program that aims to seek the newest "trend" or "scoop" for journalists will be hard to program. Not only are there multiple variables that will need to be considered in order to track the previous trends in order to predict a new story, but also determining what variables needs to be quantified and predicted is a conundrum in itself.



Depending on what kind of story the journalist wishes to report on, the variables that need to be quantified can range from previous criminal records of cities and individuals to the weather forecasts. The simple fact is, artificial intelligence can store and find information faster than any human but interpreting the information and programming the artificial intelligence with a specific purpose lies within human hands.

A more plausible artificial intelligence program could calculate the possible reception an article will receive in a given site. The AI could record the key words and structure of the inputted article, as most artificial intelligence employed in the field of journalism already has these templates programmed, and compare it to previous articles published by the news site. Variables would include the number of views, the number of likes or dislikes on SNS sites such as facebook, the number of positive and negative comments, and so on. With these variables and a clear purpose, the artificial intelligence can be given test sets and training sets by inputting the articles that have already been published so that it can adjust its weights to create an accurate program. With its intentions clear and the variables determined, artificial intelligence has the potential to become an even bigger powerhouse in the journalism industry.

# TECHNOLOGY

Perhaps the best explanation for this unusual achievement of intelligent machines lies in deep learning's design. The deep learning model is consisted of layers of interactive algorithms, which simultaneously classify intricate structures from the big data and make predictions over new input. In other words, the deep learning models is designed to act like the human brain, voraciously feeding off input data and utilizing them to further interact with the world.

The process of applying deep learning programs, neural networks, has two stages: design and training. In order to understand how these stages manifest into a neural network, an understanding of the structure of a deep learned program is required. The structure of a neural network can be separated into three segments or layers: the input layer, hidden layer and output layer. Each layer consists of a node, which serves a function by receiving different inputs and calculating a new output. The input layer essentially holds the basic information that is being valued and inserted into the neural network. The function of the different nodes in the input layer is to send information to different nodes in the hidden layer. The outputs, however, are multiplied by a certain "weight" or numerical value that is used to adjust the different numbers so that all inputs in a single node in the hidden layer will be able to balance the different inputs.





The hidden layer consists of multiple nodes that receive multiple inputs and recalculates the numbers into an output through the process mentioned above. (Figure 2) The hidden layer can consist of more than one layer with multiple nodes receiving information from nodes in a previous hidden layer, through a process known as Forward-Propagation, rather than from the input layer. Finally, the output layer consisted of what is essentially the final result of the hidden layer to create a value.



When designing a neural network there are a few factors that can be adjusted to meet the needs of the programmer. The first is determining the activation function of the several nodes within the hidden layer. The activation function is the function that is applied to the several weighted inputs in a node to create a singular output. Depending on the activation function that is chosen the result of the node can drastically change. Another decision a programmer will have to make is the amount of hidden layers. Adding more hidden layers will not necessarily lead to a better program.

After a neural network is designed it will undergo training. Unlike a traditional computer program that is burdened with several hundreds of lines of codes that all serves a singular function, a neural network is able to work with a given dataset to adjust and adapt its process. Training begins with gathering data of both the factor that is desired to be predicted and the factors that could potentially affect the desired factor. For example, when you want to predict the value of a certain produce you would find data on current prices on the produce and other factors such as size and location of the produce that could potentially affect the price.

After sufficient data is gathered the datasets are divided into test sets and the training sets. The neural network then receives randomly initialized weights that are close to zero. The first observation of the training dataset is inputted into the input layer and through Forward-Propagation a predicted result is generated. The predicted result is compared to the actual result and through Back-Propogation, (Figure 3) information is sent in the opposite manner to adjust the weights of each node. An epoch is when an entire training set passes through the artificial neural network. Multiple epochs ensure the viability of the program. The final accuracy of the training program is determined by inputting the tests set into the completed neural network.



# Figure 3 (Retrieved

https://www.tutorialspoint.com/artificial\_neural\_network/artificial\_neural\_network\_quick\_guide.htm)

This rather simplified process of an artificial neural network should give you a glimpse of the complicated nature of AI programs. This self-learning tendency gives artificial intelligent programs the ability to adapt to different situations and perform with more flexibility than a program that is created through only codes.

# IMPLICATIONS FOR EDUCATION

In order to accommodate these changes in the fields of creative writing, especially literature and journalism, future classes should find ways to incorporate AI usage into their classes. Major universities have already hosted conferences on AI and journalism. Examples include the "Artificial Intelligence: Practice and Implications for Journalism" conference that was held by Columbia University's Tow Center for Digital Journalism and Brown Institute for Media Innovation. The conferences included talks on the ethics of using AI in journalism and the practical application of the technology.

from:



Though the practical application of AI in journalism is apparent and straightforward, the ethical usage of AI is still under controversy. A panel at Columbia addressed the legal and ethical dilemmas behind the information gathering method of AI programs. Not all information on the web is legally or ethical usable and a machine doesn't necessarily understand how to make that distinction. Furthermore Amanda Levendowski, a clinical Teaching Fellow with the Technology Law and Policy Clinic at NYU Law, was quoted stating "Companies are risk averse, and they prefer to use publicly available data sets, such as the Enron emails or Wikipedia, but those datasets can produce biases," (Lichterman, J. (2017). This would mean that journalists will need to perceive the biases that may affect the findings of the AI as many economists and advertising agencies have done in the past with their own research. Biased data can potentially lead to false conclusions that due to the large nature of the AI's findings will represent an erroneous representation of an issue.

These are issues that should be addressed in classrooms for journalism. Classes must learn to accommodate the advent of AI and adapt by learning the practical and ethical issues behind implementation of artificial intelligence. With the rapid changes that are occurring in the field of journalism and creative writing as a whole, the future leaders of the field lie within those well accustomed to the new technology.

The application of artificial intelligence in classrooms can come from both lectures and active interaction. Lectures, a staple in most curriculums, allows for students to receive information in a formal, albeit trite, form. Through lectures students can learn the structures of artificial intelligence programs and the different ethical issues that surround the usage of AI. Through active interactions with artificial intelligence students will be able to acquire more practical experience. Active interaction would entail live demonstrations of artificial programming gathering information or writing over a previously created work by artificial intelligence to mimic the process of The Washington Post and the Heliograf. Active interaction does not entail the actual programming of an artificial neural network since any actual experience in that field would require extensive studying that would stray from the original goal of teaching journalism. (Luckin, R.et.al. 2016)

The current literature in the field of AI shows an increasing trend in the use of programs with artificial intelligence. Even fields that were once thought to be immune to computerization such as journalistic careers are showing signs of changing towards these programs. The most prominent example of the adoption of AI can be found in The Washington Post's Heliograf. Furthermore, even the field of fictional literature has seen the rise in AI technology. However, many organizations are still hesitant to adopt a completely automated system. Rather, they employ both AI technology and human resources in order to optimize efficiency and quality. Therefore, though the future of journalism isn't under threat of complete mechanization, the people who will find employment will be those who are able to utilize the AI technology. (Luckin, R.et.al. 2016)

Future classes in the field of journalism must be able to accommodate this change by equipping its students with the proper knowledge to work with these programs. Moreover, these classes will also have to task itself with teaching students the ethical issues and guidelines that arise due to the rapidly changing technology. With programs that can gather large quantities of information from even remote areas of the Internet can pose a threat to people's privacy or amass information without understanding bias, humans are a necessary ethical component in the future of journalism.

# CONCLUSIONS

The core aim of deep learning in artificial intelligence is to create machines that resemble humans -as God created man to resemble his form- both in intelligence and the ability to autonomously function. Studies have proven that AI has already arrived, although staggering, toward the platform of creation. While storytelling by artificial intelligence yet lacks both literary sophistication public attention, ongoing research in machine learning and the nature of establishment itself is anticipated to bring us closer to a future in which robots may move and entertain its creator.





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# The Possibilities of Music and Language Acquisition: A Proposed PAR Study

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## INTRODUCTION AND CONTEXT

Norris (2007) states that Indigenous people in Canada are the fastest growing population in Canada; specifically, Indigenous people living in urban areas are the fastest growing segment of the Canadian population. Given the significant population growth, this study focuses on methods to enhance the educational experience for youth studying Indigenous languages. Specifically, the study will explore the use of music in second language classes to increase understanding and engagement of students using a participatory action research model. A Participatory Action Research (PAR) committee will be constituted, and research involving the following classes will be submitted for its approval: A Grade Two Chipewyan Language class in Fort Smith, NWT, a Grade Two Cree Language class in Yellowknife, NWT, and a Grade Two French Immersion class in Edmonton, Alberta.

Traditional languages such as Cree and Chipewyan are being taught as second languages in the NWT. A search in the Government of Northwest Territories online database through the Aurora College Institute of Research website reveals little research on music and language. Fifteen articles were found on the music of the Inuit, but no articles or research was located specific to the South Slave region of the Northwest Territories. This study will explore the possible influence music can have on second language acquisition. Maley (1987), in his article, *Poetry and song as language-learning activities*, states, ... "one of the key factors in learning a foreign language is the ability and opportunity to play with it, test its elasticity" (94). Music allows students to do just that, in any language. Usborne, Peck, Smith and Taylor (2011) discuss Aboriginal language revitalization and describe it as one of the most important challenges Canada faces today. Usborne et al. (2011) state that of the fifty-three traditional languages originating in Canada only three currently have adequate chances of survival: Cree, Inuktitut, and Ojibway. Interestingly, two of the three languages noted for having the best chance of survival are spoken in the Northwest Territories (Cree and Inuktitut), and two are spoken in Alberta (Ojibway and Cree).

#### **Statement of Purpose**

The purpose of this study is to explore the factors that may impact the learning of a second language or (SL) among Aboriginal and French students in Northern Canada and Alberta with a specific focus on Grade Two students. The study will investigate how music might improve SL acquisition. Quantitative baseline assessments will be used in all three classes with pre and post testing to see if there is an increase in second language acquisition. Specifically, twenty-five key vocabulary terms will be used in French, Chipewyan, and Cree selected by the PAR committee. Each teacher involved in the study will be asked to conduct a pre-test to establish a baseline of knowledge of these terms. The first cycle of this research project focuses on developing key terms. During cycle two the pre and post testing will take place. During cycle three, the Participatory Action Research committee will determine if the same vocabulary should be tested again or if new vocabulary can be added.



#### **Research Question(s)**

Sagor (2005) notes that action research generally has two purposes; one purpose is to determine what is occurring in the research site, and the other is to test a hypothesis. This research project will attempt to do both. We will observe the integration of music in second language classes while testing the hypothesis that music assists with memory retention and student engagement. Our research question will focus on music and second language acquisition: How can music influence second language acquisition in students from Grade Two in the Northwest Territories and Alberta? Follow-up questions will be designed, using a participatory action research model in which participants will be given the opportunity to design the research questions. Proposed questions presented to the PAR committee include: How does music engage your students? How is engagement measured? What types of assessments do you use to measure language learning? How can drumming/singing impact second language acquisition? The participatory action research committee, which will comprise one school board member from the NWT, one parent from Edmonton, one elder from the NWT, three teachers, and two co-researchers will discuss each of the questions prior to interviewing and surveying the teachers involved in the participatory action research project.

#### **Purpose and Analysis**

Possible factors impacting second language acquisition in Canada, according to Norris (2007), include but are not limited to the legacy of residential schools, increased migration of Aboriginal peoples between communities and cities, linguistic intermarriage, and inadequate access to technology. For French immersion schools, lack of strong language models and resources could impact SL growth. Aboriginal languages are in jeopardy of survival across Canada. Usborne et al. (2011) note that a little over seventeen percent of the Canadian population is fluent in a traditional Aboriginal language, whereas Berger (2006) notes that in Nunavut proficiency rates are much higher. Within the Francophone community, the Office of the Commissioner of Official Languages states that 225,035 Albertans are Francophone. The same site shares that, "...nearly 2 million Canadian students are studying French as a second language, in either core or immersion programs (Alberta Culture and Tourism Francophone Secretariat, 2015). In total, 9,590,700 persons are considered to be Francophone across Canada. French is a growing language in Alberta while Cree and Chipewyan have seen a decline since 1989, according to the NWT Bureau of Statistics (Northwest Territories Bureau of Statistics, 2014).

In the Northwest Territories, the proficiency rates have also decreased since Nunavut split from the NWT in 1999. Norris (2007) states that declining trends in the intergenerational transmission of Aboriginal mother tongues are being offset due to these languages being learned as second languages. Music and fine arts are positive ways to promote language acquisition development/acquisition. Programs such as CODE (Council of Ontario Dance and Educators) are created throughout Canada to assist teachers with educating through the stream of Fine Arts. CODE allows for music and poetry to make readers aware of "...pitch, tempo, tone [and] develop the use of voice production stages: Respiration, Phonation, Resonation, Articulation" (2015). CODE is another program designed to assist teachers developing language through Fine Arts.

#### METHODOLOGY

Sagor (2005) notes that the first step to any successful action research project is to have a clear vision. Secondly, you should articulate your theory or hypothesis clearly. Our hypothesis is based on the previous academic research conducted by Chan, Ho, and Cheung (1998) who have stated that adults who participate in music training before the age of twelve have a better memory of spoken words than those who do not, asserting that music training in childhood has long-term positive effects on verbal memory. Chan et al. (1998) have shown this by using magnetic resonance imaging. The left planum temporale region of the brain is larger in musicians than non-musicians. (p. 1) Verbal memory is located primarily in the left region temporal lobe; thus, musicians should have stronger abilities for verbal memory.



Based on the work of Chan et al. (1998), researchers Devin Roberts and Sarah Novosel have a clear vision that music can improve memory retention and increase student engagement in second language courses. We want to share this vision with our participants so that we can build a shared ownership of the project using a PAR model. Hinchey (2008) discusses the importance of buy-in from stakeholders when conducting action research. A participatory action research model will be followed in which willing participants will form a PAR committee to assist in creating the design research questions. This committee will include a parent representative, an Elder, the three classroom teachers directly involved in the study, co-facilitators of the PAR project and one school board official (See Appendix C).

Simpson (2001) and Cajete (1999), who encourage researchers to consider Aboriginal perspectives, warn against colonialism in modern research. Simpson (2001) states that teaching and learning Aboriginal students must entail employing the processes of Indigenous teaching and learning encompassed in Indigenous methodologies. Using a PAR model will allow the Aboriginal perspective to influence and shape the direction of our research and will encourage participant buy-in of the findings and recommendations. Findings of the study will be shared with the participants to gather their thoughts and insights before publishing final recommendations. There will be three teachers interviewed pending PAR committee approval. McNiff (2013) discusses the use of action reach in the natural world. McNiff (2013) encourages the researcher to facilitate action research in a natural way allowing for the research itself to shape questions and findings. We will allow our PAR committee to develop the research as we progress by changing questions or the length of our AR cycles. Student satisfaction and success with music and language acquisition will be the focus of all PAR committee decisions.

To ensure our students feel successful during the study, we will consider the work of Vygotsky (1987). Vygotsky's (1987) zone of proximal development is a theoretical idea that a task should be neither too difficult nor too easy for students. Students need to move smoothly through a zone of proximal development, feeling successful step by step. Vygotsky (1978) also indicates that language acquisition in children occurs in social interactions, as he observed in the 1920's and 30's. Our study will include both aspects of Vygotsky's (1978) work, as children will be interacting in classroom activities and the vocabulary words being taught to students will be scaffolded from simple to complex terms. For example, first, a root word will be taught, followed by family terms. It is important for students to feel successful while being challenged. Term selection and teaching strategies will be approved by our PAR committee.

To empower communities, one representative will act as a liaison to develop and screen potential survey questions. Appendix A provides a breakdown of the format of all the research, including both qualitative and quantitative data collection. The researchers will engage stakeholders at the various stages of the action research cycle with a particular focus on the design stage, communication outcomes stage, and the taking action stage. This engagement is subject to our PAR committee approval.

#### **Participants**

Three classrooms will be suggested to the Participatory Action Research committee. It should be noted that the PAR committee will be granted the opportunity to change or add schools to the study. The following schools are suggested: A Grade Two Chipewyan Language and Culture class in Fort Smith Alberta, a Grade Two Cree Language & Culture class in Yellowknife, and a Grade Two French Immersion classroom in Edmonton, Alberta. The suggestion of Grade Two students in Yellowknife and Fort Smith was purposeful; they will be compared to their counterparts at the same grade level in Alberta. The instructors involved have experience using traditional drumming and singing in their classrooms, which will be used consistently. The selection for Grade Two French Immersion students was purposeful; the Grade Two FI class is already involved with music, but music instruction will be more consistent during this time. Programs such as Jolly Phonics or AIMS will be suggested pending approval of the committee. Jolly Phonics is a song-based program used to instill the proper use of sounds of the French language in a learner's vocabulary. AIMS is an action program in which every French word, or gender word, is assigned an action. This allows for the movement to influence a second language in a learner.

#### **Ethical Considerations**

Kemmis and McTaggart (2007) state that following a participatory action research model does not guarantee empowerment of participants involved with research cycles, especially those such as ours that requires their input. The researchers will follow ethical standards that are outlined by the University of Calgary Conjoint Faculties Research Ethics Board, to ensure participants truly have a voice at each stage of the research. Using a PAR approach to research, Smyth and Williamson (2004) noted that creating a research advisory group made of various stakeholders including policy makers and service deliverers was important to respecting ethical guidelines in their project studying war-affected populations in Northern Ireland. Smyth and Williamson (2004) note,

"A research advisory group was established for each project, and representatives of donors, policy makers, and service providers were invited to participate in that group, which monitored the research design, piloting, fieldwork and other data collection, analysis and documentation and dissemination." (p. 146)

For this PAR project, both our PAR committee and the supervisory committee established through the University of Calgary will oversee the research. The committees will advise us on stakeholder engagement and ensure we are following ethical guidelines. The PAR committee will provide documentation, including the guidelines and policies of the University of Calgary Conjoint Faculties Research Ethics Board. The supervising committee will be able to point out ethical considerations for the researchers to consider; however, ultimately it will be the researchers' responsibility to conduct ethical research.

#### **Consent Plan**

Leadbeater (2006) asks whether individual youth participants are competent to give consent or assent. This, in turn, raises questions about the appropriate gatekeepers or guardians who can give consent or speak on their behalf. In Canada, young people's legal right to consent to research participation varies by province. In Alberta, the age of consent is eighteen, and in the NWT it is nineteen. The University of Calgary Conjoint Faculties Research Ethics Board, which follows the Government of Canada's Panel of Research Ethics standards, states that young people between sixteen and eighteen years of age with sufficient understanding are able to give their full consent to participate in research independently of their legally authorized representative. As the study will be working with students in Grade Two between the ages of eight and nine years, parental consent will be necessary.

Without parental consent, ethical and practicality issues will arise. Because the key vocabulary used will be pulled from provincial and territorial curricula, all students can participate in the class activities that involve music-based activities. The three teachers involved in the study will be asked not to share the results of the students without consent. The researchers involved with the study will be aware of who these students are based on the collection of consent forms and will also ensure that their information is excluded from the study. Initial consent will be applied to the University of Calgary Conjoint Faculties Research Ethics Board that reviews research ethics. The Government of the Northwest Territories requires all research involving human subjects to follow the guidelines and application process of the Aurora College Institute for Research. Once permission has been received from the University of Calgary in conjunction with the policy and procedures of the Tri-County Research Ethics Committee, Aurora College's application process will begin. In total, it could take up to two months to complete. Thus, with respect to commensurability of the project, application for this should begin as early as August of 2018. Both school boards/districts involved with the study will need to give their permission and will require their own consent forms to be signed by participants. As early as September of 2017 the specific school boards involved will be contacted, and permission for research involving primarily teachers, but also students, will be requested. The two respective school boards have indicated that permission can be obtained within four weeks, but this is subject to change. The action research project itself will not be scheduled to fully commence until January of 2019 to allow all necessary paperwork, consent and permission to be obtained.



The expected completion of the research would be January of 2020, allowing one year to conduct all relevant research with regards to this action research project. This would allow for a total of six months to a year for a review of the findings of the research to be shared with stakeholders and the PAR committee involved with the initial design of the project. The PAR committee can decide to extend or shorten the study's timelines.

An incommensurable aspect of our research would be the wide range of students and teachers involved in the study. There would be a major discrepancy in the years of experience as well as the education of the participants in Alberta and the NWT. The Northwest Territories does not require Aboriginal Language and Culture teachers to hold a Bachelor of Education degree. However, in Alberta, French language teachers are required to hold a B.Ed. However, as of late, and due to lack of language teachers available, the Edmonton Catholic School District has begun to hire Educational Assistants with language backgrounds (such as French), to instruct certain courses where class sizes are larger than 25 (Veilleux & Bournot-Trites, 2005). These Educational Assistants then become instructors, and because they do not hold a degree in Education, must then be supervised in some capacity. Aboriginal Language and Culture teachers can prove their competency through completing language aptitude tests. There is a wide range of experience and education with our ALC teachers. Some hold master's degrees, while others have immense on-land experience and knowledge. This could cause questions about the validity of the study's findings and raise ethical questions. It will be important that the study provides this information to the public.

As language revitalization is linked to the residential school experience, sensitivity must be given to the data collection process. Some participants who are educators may have been students in these schools. Bloomberg and Volpe (2012) suggest that the success of a study can be impacted if ethical standards are not met. The University of Calgary Conjoint Faculties Research Ethics Board refers to decision-making capacity as the ability of potential or actual participants to understand relevant information presented in research. The researchers must explain all aspects of the study to participants involved in Alberta and the NWT. Information will not be shared without proper consent being authorized due to learning being a sensitive topic.

# METHODS

"Participatory action research *does* provide opportunities for co-developing processes *with* people rather than *for* people" (McIntyre, 2007, p. 12). We intend to have all stakeholders involved in each cycle of our action research through collaboration and discussion, and with decisions based on the committee's approval. Koch, Mann, Kralik, and van Loon (2005) describe a similar three-cycle participatory action research project in which the researchers consulted Indigenous peoples in Australia by listening to the recommendations of participants involved in the research initially in shaping their questions. Koch et al. (2005) describe the importance of listening and responding to the voices of elders and stakeholders during the various cycles of PAR, especially in cycle one and three. Koch et al. (2005) state,

It is argued that reflection occupies a central place in participatory action research cycles of 'look, think and act.' 'Look, think and act' processes are appealing precisely because they are meaningful to research participants in their everyday lives. When these processes are internalized as modus operandi, they can be sustained throughout one's life as strategy for building capacity or moving on. (p. 261)

We will empower our educators in very much the same way as Koch et al. (2005) describe, ensuring that respective communities consider teachers, elders, parents, and school board officials. We will also recruit an elder to sit on our observation committee, advising the researchers on all three cycles of the action research project. In the second cycle, Koch et al. (2005) describe answering questions and conducting interviews via email. As bandwidth and Internet connectivity can be an issue in the NWT, the researchers involved may have to rely on the phone and inperson visits to receive the necessary participant feedback. This is why Yellowknife and Fort Smith were selected; these communities are relatively close to one another. Researcher Devin Roberts will be based out of Yellowknife and Fort Smith during the research cycles while Sarah Novosel will be living in Edmonton during the same time. These locations are subject to the approval of the PAR committee.



Koch et al. (2005) describe the third cycle of action research as capacity building. As we hope our research will have long-term significance for possible curriculum design and implementation, it will be important that our research committee is active in reviewing data collected and discussing future action. We hope to make recommendations that can be used by both the territorial government in the Northwest Territories and the possibly the provincial government in Alberta; thus, input for stakeholders will be essential. Elders, school board officials, and parents must see this research as their own and not simply something teachers and the researchers have designed and concluded. The findings of this study will be shared at the annual NWT Teacher's Association conference in February of 2021.

#### **Action Research Design**

Hinchey (2008) shares that the most important thing to do first is to look at one's classroom and accept what needs to be changed. This is where a committee would be selected, and the group would discuss questions and concerns. One initial concept Hinchey (2008) states that could have an impact on the research is that for teachers, "...improvements they pursue are varied as teachers and classrooms themselves" (p.3). Therefore, the group will decide on one or two methods to try to improve language through music. Once the questions and specific musical strategies are decided upon, teachers will use these strategies in the classroom, with the support of the committee, to see if their strategy works. During this time, it is crucial that the teacher and committee members involved take various forms of data as proof. From there, the committee will meet again to review data and decide what needs to change for the next cycle, and what can remain the same. Hinchey (2008) states,

It's not enough to plan and implement an action: its results must be systematically analyzed to determine whether or not the desired improvements have occurred and whether unintended consequences, good or bad, turned up well. For this reason, the process is generally described as being cyclical (p.4).

This cycle will be repeated two times before the final data is collected and analyzed. From this data, the committee will be able to make a final decision regarding music and best practices for its integration to support and improve language acquisition practices.

#### **Implementation Plan and Timeline**

The implementation will begin on a set date, given by the committee, which ideally would be January of 2019. There will be regular check-in dates. "Check-ins" will be done through submitting reflection pieces, or answering questions created by the committee. "Checking in" will occur weekly. Check-ins will be the responsibility of the co-facilitators but will require the input of the teachers whose classrooms are being studied and the PAR committee. Sagor (2005) states that researchers should reflect on the experiences that are occurring and provide feedback to the participants involved deciding on what to focus on during the next cycle. In particular, it will be important to collect pre and post assessments on student performance during cycles one and two. Each cycle should last three months. This is because, in language programs, repetition and time are key for students in acquiring new skills. In total, this project will last nine months, which is almost an entire school year. Results from district mandated assessment tools can be used to measure student improvement between years, allowing the committee to come to stronger conclusions. The PAR committee can determine if a cycle needs to be shorter or longer.

#### **Knowledge Mobilization Plan**

According to the University of Saskatchewan, "...knowledge mobilization requires careful thought and planning" (p.1, n.d.). This informational site also includes questions that researchers should include and respond to, to ensure the success of their research. These questions will be used in the various cycles to ensure that the plan is well developed and properly executed.

The first step is to "develop awareness or interest" (University of Saskatchewan, n.d., p.1). This will be done through collaborating with others in various provinces and providing documentation of questions or statistical facts to stir the curiosity of stakeholders and participants.



Second, the University of Saskatchewan suggests that one should, "generate practice change" (n.d., p. 1). This would include teachers being encouraged to try different strategies or materials when practicing music in the classroom. These purposeful choices impact results, so it is imperative that ethical considerations are taken into account.

"Public action/policy action" (n.d., p. 1) would be the end of the last cycle and is perhaps one of the more imperative steps. This is where the data, conclusions, results and information are shared. This information, however, should be used to improve communities. This is why stakeholders are crucial in the process when promoting change to a broken system. Levin states,

knowledge is socially constructed and its use takes multiple forms that can be more or less direct or more or less rapid, with slower and less direct impacts more common. Some of the most powerful examples of research knowledge leading to changes in policy and behavior—for example, smoking or use of seatbelts or the end of corporal punishment in schools—took several decades to evolve. (Levin, 2008)

The University of Saskatchewan also discusses the importance of "Gain[ing] new knowledge/further[ing] research" (n.d., p. 1). This knowledge may assist in determining future district or provincial goals, depending on how interest is developed, which is the first step in this plan. The new knowledge gained through data collection may also leave researchers or the community with new questions, allowing the research to be taken to a new level in the future.

# Significance of the Study

It is the hope that the findings of this study could be used to assist in the development of new Indigenous and French language curriculum in Alberta and the NWT. Currently, the NWT and Alberta are in the midst of creating new language programs. Educators will have the opportunity to make suggestions for curriculum improvement. This study could be used as an example of how to involve second language learners in music to improve engagement and memory in the classroom.

This participatory action research project provides a case study that other schools can use as research to explore the use of music in the classroom with language learning. If the study can provide tangible evidence of music assisting with language acquisition across three diverse classes, it could prompt further research on the topic. It is also encouraged that research findings will demonstrate to teachers the importance of collaboration. Hopefully, a sense of community engagement and appreciation can be shared between the three communities, celebrating language and learning.

# CONCLUSION

This research project suggests that there may be a relationship between music and second language learning when the educational experience is more enjoyable and engaging for students. However, beyond the mood and emotional connection music can provide, previous research suggests it can also assist with memory and language retention. Patel (2008) suggests that one can learn the "rhythm" of a language for accuracy with fluency and understanding for the listener. Patel (2008) suggests that this rhythm of language can be learned orally and through both singing and drumming. Maley (1987) also shares that music and poetry discuss "…themes/common to all cultures [such as] love, death, nature, children [and] religious belief[s]" (p.94). Conducted in three unique settings with two different languages, this action research project will demonstrate that music enhances a learning environment. It will be impossible to draw full conclusions until the research is complete. Pre/post- assessments during the first and second cycle of the action research project will also attempt to show a relationship between music and memory retention. (Refer to Appendix B for data collection cycles). Fisher and Frey (2014) discuss the importance of applying words one remembers from a language and moving from shallow knowledge of words such as remembering them, to applying vocabulary in spoken word and writing. Our pre and post assessments will test memory as well as the application of the language.

The success of this three-cycle participatory action research project will hinge on the research committee's ability to complete the three cycles in a timely fashion. If disagreements about the types of questions and assessments occur, the proposed timelines may not be achieved. It will be the responsibility of the researchers to meet with the PAR committee regularly so that all members of the committee are active. We look forward to the challenge and opportunity this participatory action research project presents and welcome feedback from colleagues and the public regarding this upcoming project.

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# Appendix A

Method of PAR	Time
3 Qualitative in person interviews (20-25 questions)	One hour to complete.
15 Quantitative online survey (15 questions)	30 mins to complete.
15 Quantitative paper survey (20 questions)	30 mins to one hour to complete.
3 Qualitative phone interviews (10-15 questions)	30 mins to one hour to complete.

# Appendix B





# Appendix C

- 1) Educator in Fort Smith
- 2) Educator in Yellowknife
- 3) Educator in Edmonton
- 4) Elder from the NWT
- 5) Local School Board Member (SSDEC)
- 6) Parent in Edmonton
- 7) Two Doctoral Students University of Calgary (Devin Roberts & Sarah Novosel)

# Appendix D



Appendix E



Alberta's French-speaking population (2011 Census unless otherwise stated)								
	Definition of terms	Ranking						
French/Acadian origins (2006): 390,895 (12 percent)	<ul> <li>Refers to the ethnic or cultural origins of the respondent's ancestors and does not take into account knowledge of language.</li> </ul>	<ul> <li>Provincially, 3<sup>rd</sup> largest cultural origin after British/Scottish and Germans.</li> </ul>						
French-speaking: 238,770 (6.6 percent)	<ul> <li>Refers to the individual's self identified ability to conduct a conversation in French.</li> </ul>	<ul> <li>Provincially, 2<sup>nd</sup> largest language group after English.</li> </ul>						
Francophone: 81,085 (2.2 percent)	<ul> <li>Refers to the first language learned at home in childhood and still understood by the individual.</li> </ul>	<ul> <li>Provincially, 3<sup>rd</sup> largest mother tongue language group after English and German.</li> <li>Excluding Québec, 3<sup>rd</sup> largest Francophone population after Ontario and New Brunswick.</li> </ul>						
Unilingual French- speakers: 3,205 (0.0 percent)	<ul> <li>Refers to individuals who do not speak any English.</li> </ul>	<ul> <li>Provincially, there are 5 other languages with more speakers who cannot speak either English or French (Chinese, Punjabi, Cantonese, German and Vietnamese).</li> </ul>						



# The Priorities in Educational Technology Leadership that Determine it Infrastructure in Western Canadian K-12 School Districts

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# ABSTRACT

This is a report on the priorities that shape the educational technology infrastructure in K-12 school districts in Western Canada. This paper is based on the findings of an exhaustive study of all 75 large K-12 districts in British Columbia, Alberta, and Saskatchewan, encompassing over 1.1 million students. Using a data transformation model mixed methods triangulation design methodology, this study identified the priorities held by the leaders who determine the information technology (IT) infrastructure in K-12 schools. Interviews revealed the priorities of greatest absolute and relative importance to IT leaders. Multiple case study analysis, followed by correlation analysis, explored which priorities produced statistically significant differences in K-12 IT infrastructure. This included software and platform decisions across all major district IT functions. A finding of this study is that environmental influences, namely government policies, are the greatest determinants of IT infrastructure in Western Canada. This is particularly revealing as environmental influences were not identified by participants themselves as having the greatest influence on their IT infrastructure decision-making. Participants typically identified adopter characteristics and technology characteristics as superseding environmental influences in their IT decision-making. However, these two self-identified top priorities rarely produced differences in IT infrastructure.

# **INTRODUCTION**

Contemporary teaching and learning activities in formal K-12 education are profoundly impacted by information technology ([IT] Chao, 2012; Papa, 2011; Picciano, 2011). This is true of the 75 districts examined in this research of Western Canada. This is consistent with others' findings that use of IT to support education is a global phenomenon (Alamin, Shaoquing, & Le, 2015; Dinçer, 2017; Pérez-Sanagustín et al., 2017). Underpinning the use of IT by students and teachers are the infrastructure decisions made by school district leaders. In Western Canada, this leadership is centralized in the office of the district superintendent, who makes nearly all of the major IT infrastructure decisions for the multiple schools in a district. This finding in Western Canada echoes the findings of others with regard to districts in Canada and the United States as well (Collins, 2012; Stein, Ware, Laboy, & Schaffer, 2013). A purpose of this study of IT infrastructure decisions from the superintendent's office for multiple district schools. What are the top priorities that shape the technologies available to students and teachers within a district?

An important distinction concerning this research is that it was a study of organizations' rather than individuals' innovation adoption. Whereas individual innovation adoption is concerned with the factors that influence adoption by an individual for the same individual, organizational innovation adoption is concerned with the factors that influence the decision concerning an innovation to be adopted by others. The notion of agency is central to organizational innovation adoption, where decisions are made for the benefit of others by a district's leadership. The conceptual framework of organizational innovation adoption by Frambach and Schillewaert (2002) was found to be the most appropriate by the researcher for the purposes of this study. The details of this framework, and the associated findings, will be discussed further in the findings section of this paper.

# THE STUDY

This study followed a data transformation model mixed methods triangulation design methodology. This study included all 75 large K-12 districts in British Columbia, Alberta, and Saskatchewan. Eighty semi-structured interviews were conducted with senior IT leaders, ranging in length from 30 minutes to over an hour and half. The study encompassed the IT infrastructure and IT leadership affecting over 1.1 million students in Western Canada.



Large school districts in this study were defined as districts exceeding an enrollment of 5,000 students in the 2012-2013 academic year. The 5,000 student or more threshold ensured that districts with comparable infrastructure needs were examined. This was an essential feature of the multi-case and cross-case analysis in this study (Stake, 2006). This design decision was a modification of Maas's (2010) study, which set the threshold for the definition of a large school district at 10,000 students in a United States context. In a Western Canadian context, the 5,000 student threshold was more appropriate because of the much smaller number of districts with 10,000 students or more. As with Maas's research, the purpose of this study was to produce findings that would be generalizable across a large number of districts (Adams & Umbach, 2012). Seventy-five districts in Western Canada met the 5,000 student enrollment threshold, and all were examined in this study.

During 2014 and 2015, the senior IT leaders of school districts in Western Canada were identified using referential/snowball sampling techniques. Document analysis was used to inform the recruitment processes, prior to contacting K-12 districts. The use of online documents from district websites and organizational charts provided insights concerning who was responsible for the IT infrastructure decisions in each district. Participants were then contacted by phone call, through the main school district's office, which then confirmed the participant's responsibilities for IT infrastructure in the district. This added an early triangulation aspect to the research during the recruitment process. In some instances, the district website information was outdated concerning staff responsibilities. The process of contacting the main school district's office provided accurate, updated contact information for participants, as well as helped clarify current IT leadership responsibilities in the district. Participants themselves, during the course of the semi-structured interview, then provided additional details concerning organizational hierarchy and responsibilities for IT infrastructure in the district. This added an early triangulation aspect to the research during the terviewed. The additional hierarchy and responsibilities for IT infrastructure in the district. This in the district. This confirmed that the appropriate individuals were interviewed. For the 75 districts in Western Canada, 80 senior IT leaders were interviewed. The additional interviews served the purpose of triangulation, as well as provided information on IT infrastructure details that the first participant from that district did not have.

In addition to IT infrastructure decision-making and IT infrastructure information, participants were asked to provide information concerning their perceptions of the priorities and influences that shape their district's IT infrastructure. These priorities and influences were derived from the Frambach and Schillewaert (2002) framework. The priorities and influences portion of the semi-structured interview asked participants to identify the strength of influences on a rating scale of 1 to 5. One indicated that an organizational innovation adoption factor had *very little influence*, and five indicated that a factor had *very much influence*. Participants were then asked to rank these same factors from *most important* (1) to *least important* (5).

As is appropriate for the data transformation model mixed methods triangulation design methodology, this study involved a single data collection phase (Creswell, Plano-Clark, Gutmann, & Hanson, 2003). Unlike with the sequential exploratory model, where the qualitative data collection phase is followed by a separate quantitative data collection phase, this methodology requires only a single data collection phase (Plano-Clark, Huddleston-Casas, Churchill, O'Neil-Green, & Garrett, 2008). The data transformation model mixed methods triangulation design applied here involved the transformation of qualitative data to quantitative data through a coding process to enable statistical analysis. The choice of this design also enabled a higher participation rate in the study because it limited the time commitment of the district senior IT leaders, who might have otherwise been too busy for an additional data collection phase.

Correlation analysis was applied to both qualitative and quantitative data collected. The initial qualitative findings concerned IT infrastructure and leadership. These were analyzed and triangulated based on interview transcripts, field notes, and document analysis. This qualitative data was then transformed into bivariate data for statistical analysis. Quantitative data, namely the rating and ranking information from participants concerning the organizational innovation adoption factors, were unchanged. Correlation analysis was then conducted on both the transformed qualitative data and on the quantitative data using Pearson's Chi-square and Fisher's Exact test. These statistical calculations were performed at a significance of 5%. The decision to use a 5% significance level was based on the conventions of educational research, and the lack of special circumstances within this research that would have necessitated a deviation from these conventions (Gay, Mills, & Airasian, 2009).

The conceptual framework of organizational innovation adoption by Frambach and Schillewaert (2002) was used in this research to guide the semi-structured interviews. This framework is presented in Figures 1 and 2. Only Figure 1 is applicable to this research because it is the portion of the framework that focuses on organizational innovation adoption by a district's senior leaders on behalf of the organization's individuals. Figure 2 focuses on the subsequent adoption by the organization's individuals, which was beyond the scope of this study.



*Figure 1*. Conceptual framework of organizational innovation adoption (Frambach & Schillewaert, 2002, p. 165)



*Figure 2.* Conceptual framework of individual innovation acceptance in organizations (Frambach & Schillewaert, 2002, p. 167).

As is evident in Figure 1, Frambach and Schillewaert (2002) identified five factors that influence an organization's adoption (or nonadoption) of an innovation: supplier marketing efforts, social network,
environmental influences, perceived innovation characteristics, and adopter characteristics. Frambach and Schillewaert originally presented the conceptual framework in detail for an academic audience. The original text used scholarly language with comprehensive references to academic and business literature. Given the time constraints of the semi-structured interviews, and the diverse backgrounds of the participants, abbreviated layman descriptions of these five factors were provided to the study's participants for their rating and ranking. Table 1 presents these simplified descriptions provided to the study's participants by the interviewer of Frambach and Schillewaert's organizational innovation adoption factors.

Table 1: Frambach and Schillewaert's (2002) organizational innovation adoption factor descriptions.

Frambach and Schillewaert's (2002)	Simplified Descriptions for Study Participants
<b>Organizational Innovation Factors</b>	in the Semi-structured Interviews
Supplier marketing efforts	"This refers to the materials from vendors and solution providers
	concerning a technology you are evaluating. This would be what
	Google and Microsoft say about their products, the new feature,
	performance information, etc."
Social network	"This refers to your trusted advisors and those knowledgeable in
	IT. This might include your counterparts in other districts, as well
	as the recommendations of your acquaintances who work in other
	industries."
Environmental influences	"This refers to factors outside of your district, such as government
	policies and the actions of other districts around you. Unlike
	Social Network, where you have a relationship with the people you
	are speaking with, Environmental Influences refers to the actions of
	other districts with which you may not necessarily have a
	relationship. For example, when the districts around you do a
	certain thing, there is a pressure for your district to also do that
	thing -or to at least have a good reason for not doing that thing."
Adopter characteristics	"This refers to user needs. This would be the needs of the students,
	parents, teachers, etc. who will be impacted by the technology you
	are considering. Will the technology you are adopting be a good fit
	for them?"
Perceived innovation characteristics	"Unlike the previous factors, which were not focused on
	technology, this factor refers to the purely technical aspects of the
	technology you are considering. This includes reliability,
	performance, cost savings, etc. These are the purely technical
	aspects of the solution you are considering. This factor is not
	related to people or policies."

#### FINDINGS

This study revealed that the most important factors that IT infrastructure in Western Canada are, in order of greatest importance: adopter characteristics, perceived innovation characteristics, environmental influences, social network influences, and, lastly, supplier marketing efforts. Beyond the relative rank of these organizational innovation adoption factors, this study also asked participants to rate the importance of each factor. A finding of this study is that the participants found all of these factors, with the exception of supplier marketing efforts, important in shaping the IT infrastructure decisions in their districts. The four top factors varied only slightly in their degree of influence, as described by the study's participants. Figure 3 summarizes the participants' responses concerning the strength and rank of the organizational innovation factors in Frambach and Schillewaert's (2002) conceptual framework.



Figure 3 presents the findings of the initial analysis of the organizational innovation factors and shows the mean values for the strength and rank of the influences and the priorities that shape IT infrastructure in Western Canadian K-12 districts. The second stage of the analysis was to identify statistically significant relationships among the organizational innovation adoption factors and IT infrastructure. Correlation analysis revealed that the top two priorities of adopter characteristics and perceived innovation characteristics were rarely linked to statistically significant differences in IT infrastructure between districts. Surprisingly, the third ranked factor of environmental influences was found to be the greatest determinant of IT infrastructure of the factors examined through the Frambach and Schillewaert (2002) framework.

The importance of user needs (adopter characteristics) and the performance characteristics of the technology under consideration for adoption (perceived innovation characteristics) was universal across all districts in the study. However, the statistical analysis revealed that these top two priorities rarely determine IT infrastructure. Conversely, environmental influences, such as a district's location and/or size, were found to be the most frequent correlates of differences between the IT infrastructure of districts. This finding concerning environmental influences is insightful as though environmental influences were identified on average as the third most important factor in a district's IT infrastructure decision-making, it was found to be the greatest determinant of IT infrastructure.



*Figure 3.* Mean strength and rank of influences shaping IT infrastructure in Western Canada. **CONCLUSION** 

K-12 districts should examine IT solutions for adoption, renewal, and so on through the lenses of Frambach and Schillewaert's (2002) organizational innovation adoption factors in descending order of importance. The first factor is whether the technology meets the needs of the district's users, such as students, teachers, parents, and so on. This corresponds to the adopter characteristics factor, which the participants ranked and rated the highest of the five factors examined. The second factor is the technology's reliability, features, cost, and performance, which corresponds to perceived innovation characteristics of the organizational innovation adoption framework. The third factor for evaluation should be environmental influences. This factor includes regional regulations and other organization's use of similar technology. The fourth lens should be the thoughts and opinions of knowledgeable peers, which corresponds to the fourth factor of social network influences. The final and least influential factor is the supplier marketing efforts.

Environmental influences, though the third ranked factor in the study by participants, was found to be a strong differentiator between districts concerning their IT infrastructure. When districts are affected by different environmental influences, their IT infrastructure similarly differs. The other organizational innovation adoption



factors did not have such a pronounced impact.

A key finding of this study is the extent to which K-12 district IT infrastructure is shaped by the environmental influences affecting a district. The first two organizational innovation adoption factors of adopter characteristics and innovation characteristics were widely held top priorities/influences by districts. Regardless of the district's IT infrastructure, it was nearly universal for the IT leaders interviewed in this study to say that their decisions were guided by user needs and the technical characteristics of what they were considering for adoption, were adopting, or had adopted. In contrast, environmental influences differed considerably across districts and their provinces. With differences in environmental influences, such as government policies for a district's province, clear differences emerged between districts' IT infrastructure.

This study's findings suggest that understanding and affecting district environmental influences can facilitate changes in IT infrastructure. A key implication of this is that educators, educational leaders, parents, students, and technology vendors desiring a change in a district's IT infrastructure should seek to affect regional legislation. An example of such regional legislation, identified by the by study participants, is provincial privacy legislation. Several IT leaders interviewed in this study asserted that their districts would have different IT infrastructure and utilize public cloud solutions more widely if their provincial privacy legislation was different. Alternatively, these educators, educational leaders, parents, students, and technology vendors seeking change can also be effective by pointing to successful adoption cases of a technology by other comparable organizations in similar geographic and size categories. An example of this is the use of public cloud solutions, such as Google's G Suite or Microsoft's Office 365, in public sector organizations within Western Canadian provinces. Similarly regulated organizations' use of a technology alleviates compliance concerns.

The findings of this study on the influences and priorities that shape IT infrastructure in K-12 districts reveal an interesting paradox. Though the IT leaders universally acknowledged that user needs and technical characteristics are, respectively, the first and second most important organizational innovation adoption factors that guide their infrastructure decisions, the third most important factor, environmental influences, impacts IT infrastructure the most.

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## The Relations Between Play and Learning and Teacher's Role

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#### ABSTRACT

Play has an important role in early childhood education. Play is effective means for promoting all aspects of children's development and learning. The purposes of this study are to identify the relations between play and learning and the teacher's role to encourage play. The results of this study are as follows: First, play promotes learning, and guided play is a powerful teaching tool. Play is seen as contributing to 'Quality Learning' because it provides the ideal conditions in which to learn. These ideal conditions include spontaneity, inner motivation, active behavior, concrete experience, symbolic transformation, and repetition. Second, teacher's role are setting the stage for children's play, emphasizing the process rather than the product, observation for when teacher are needed, encouragement for children's involvement, and supporting children in their problem solving. Teachers can promote children's play and learning.

#### **INTRODUCTION**

Play has an important role in early childhood education, play has been viewed as an effective means for promoting all aspects of children's development. Play contributes to cognitive development, encourages problem solving, supports children's language and literacy, furthers social abilities, and helps to express emotions.

In addition, play is the most important way that young children learn. Through play, children learn physical, social, emotional, cognitive worlds around them (Anderson, Spainhower, & Sharp, 2015).

Play has been viewed as a valuable component of young children. Vygotsky described play as the leading facilitator of development in young children wherein children learn to think abstractly and impose arbitrary meaning on objects and actions. Piaget described play as assimilation where children assimilate or solidify their existing knowledge through play. Therefore, children's play is a reflection their cognitive development (Dunn & Herwig, 1992).

Psychologists, researchers, educators have long recognized the value of play in children's learning and development. Play is an absorbing activity and fundamental means for gathering and processing information, learning new skills, and practicing old ones. It is the ultimate realization of learning by doing (Wellhousen & Kieff, 2001). Freud viewed play as an emotional release for children, whereas Erikson believed that play helped children develop self-esteem and gain mastery of their thoughts. Piaget discussed two important by products of play one being joy and the other learning. Vygotsky believed that through play, children stretch beyond their own understanding and develop new skills and abilities that support further learning and development. Play touches on every aspect of development and learning (Rogers & Sawyer, 1992).

Play can be defined as 'open-ended', 'self-chosen', 'enjoyable actions and activities that unite and integrate cognitive, language, social, emotional, and motor aspects of learning within rich, culturally sensitive, child-centered, and supportive contexts' (Kieff & Casbergue, 2000). Therefore, when children play, many elements of an enriched environment are present.



But many parents do not understand the value of play. They become confuse about whether play is really a want to learn (Singer, Golinkoff, & Hirsh-Pasek, 2006). Play is an opportunity for children to learn more about their world, to stretch to accommodate new ideas and to foster their imaginations. Despite extensive evidence on the value of play, many parents begin to question its utility, play is behind in education.

Learning is difficult to define. According to Malone (1991), learning is the matter of our minds, and including thinking, becoming aware, imagining, seeing, hearing, hoping, remembering, abstracting, planning, and problem solving. Learning is deep in our species, emerging from our desire to take in new information by actively exploring new territory. Thelen and Smith (1996) reported that learning is a physical phenomenon, occurring in the sensory system, and in the brain where neurons send out neurotransmitters and forge networks of connections; and in the body where motor patterns are encoded for actions. Learning is also embedded in the world via life experiences, social interactions, and community membership. Because learning occurs at so many levels simultaneously, developmental science does not privilege any level of analysis over any other (Ostroff, 2012).

Children's learning was considered something of an unknown or 'black box' until recently (Gerner, 1981). In the last few decades, the field of developmental science has exploded with discoveries of how learning happens, giving us an entrée into children's mind. We can understand how and when children begin to think, perspective, understand, and apply knowledge (Ostroff, 2012).

In the early 1900s, when most industrialized countries began offering formal, public schooling to children, the curriculum were designed for future workers in an industrialized economy. Teaching techniques based on commonsense assumptions. For example, that knowledge is a collection of facts and procedures, that the teacher's job is to transmit those facts and procedures to students, and that success at school is determined by testing to see how many facts and procedures students have acquired (Sawyer, 2006). Teaching practice that require children to work individually in rows, to complete with others for good grades, to take tests alone, to concentrate for long periods of time without breaks, and to be put into reading or math groups with only peers of matched ability are based on tradition alone – not at all on evidence of student learning (Ostroff, 2012).

There were little time for play; the focus is on memorization of the 'fact'. Indeed play is viewed as a waste of time when more important 'work', the work of memorizing, could be done. As the pressure on children in school increases, paradoxically their ability to relax and just have fun through play is being restricted (Singer, Golinkoff, & Hirsh-Pasek, 2006).

Today, many schools have reduced or eliminated recess time. This is unfortunate, because during recess, children engage in play. Recess is an important part of the schedule, and return to classrooms refreshed and ready to learn. Children who had recess time score high on reading tests. Children who play together learn to work together (Singer, Golinkoff, & Hirsh-Pasek, 2006).

Class time across the country is now spent in either assessment or assessment preparation. Children learn to fill in the blanks with rote answers. The classrooms were designed to help children do well on standardized assessments. Schools have either dropped or cut back on creative curriculum (Singer, Golinkoff, & Hirsh-Pasek, 2006).

Children are not passive recipients of information, waiting to be filled like empty vessels. They are active, exploratory, and involved in the creation of their own knowledge (Ostroff, 2012).

Thus the purposes of this study are to identify the relations between play and learning and the teacher's role to encourage play.



#### **RESEARCH QUESTIONS AND METHODS**

The main research questions posed in this study are as follows:

- 1. What are the relations between play and learning?
- 2. What are the teacher's role to encourage play?

To investigate these research questions, the researcher reviewed the studies of play and tried to investigate the value of play and how play motivates and enhances young children's learning.

#### RESULTS

#### What are the relations between play and learning?

Play is a wonderfully natural and spontaneous setup for learning. Children have an intention to play as a means of exploring and being inventive, creative, and curious (Ostroff, 2012). Learning is effective when students have these characteristics and play also has these characteristics: spontaneity, inner motivation, active behavior, concrete experience, symbolic transformation, and repetition.

First, **Spontaneity.** Effective learning process has student's spontaneity. It's not pulse but spontaneous. Play also has spontaneity, it already effective learning requisites is included. Play is first and foremost a voluntary activity. Play is also the central activity during the time in development when humans are at their most receptive to knowledge, making it the ideal vehicle for learning (Lee, 2007; Ostroff, 2012).

Especially unstructured free play is especially important for learning. Children's performance on skills differs tremendously when they are left alone to play. The importance of child-directed play cannot be overstated. Play is more advanced when children take the lead.

If we are extra-sensitive to children's cognitive, social, and emotional needs for free play, we will allow them the pleasures of creativity, spontaneity, independence, and the sense of power. Children also engage more fully in the classroom and do better in school. Thus children who play spontaneously can better perform in learning.

Second, **Inner Motivation**. Motivation is the driving desire behind all action and is the precursor and cornerstone to learning. To motivate children and keep them primed for the best learning possible, we must understand how motivation to learn develops. Motivation is a readiness to learn.

Children like to play. Children are by nature playful. They enjoy playing. Why do children love to play? Because play is intrinsically motivated. They play by their inner motivation. Play is intrinsically motivated. As an intrinsically motivated behavior, play maybe the most important process through which children learn to adapt to the world and become more mature. If we are to understand the value of play, we must know why it is so important for play to be intrinsically motivated (Rogers & Sawyers, 1992).

Gottfried (1985) offered three theories of intrinsic motivation related to play: cognitive discrepancy, competence/mastery, and attribution.

a) **Cognitive discrepancy**. Children are curious. They like to explore new things. They delight in being surprised. All of these features of cognitive discrepancy. The idea of cognitive discrepancy can help us identify the 'characteristics of play materials and play experiences that increases arousal and facilitate play'. How much discrepancy is effective? It appears that a moderate arousal level is most likely to lead to complex learning (Sutton-Smith, 1979). In play, children tend to select activities that offer most effective level. They voluntarily elaborate and complicate the activity. Adults can provide the appropriate materials and setting, but only children can select the best match in which learning is most likely to occur (Rogers & Sawyers, 1992).

b) **Competence** / **Mastery.** Play is a child's way of controlling the environment. Through play children learn that they can cause things to happen or change. Children begin to see how what they do has cause and effect, and they begin to assume responsibility for their behavior. When people or objects are not responsive to children's actions, children give up in despair, not because of the actual severity of the situation, but because they feel they have little or no effect on it. Children learn to feel helpless when they experience events they cannot control or are led to believe they cannot control (Seligman et al., 1984). Children's self-esteem and sense of competence is affected by whether they feel they have some control over what happens to them (Connell, 1985). Children who have a strong sense of self-worth are much more likely to be well-rounded, mature individuals.

Challenge can enhance children's motivation to gain even further mastery over their environment. Another value of play is that children can pick the level of skill and challenge with which they feel comfortable. Children who experience success are more likely not only to want to repeat the experience, but to want to take on new or more difficult challenges as well. Play gives children the opportunity for success (Rogers & Sawyers, 1992).

c) Attribution. When children are self-motivated, they enjoy the activity for itself. Externally motivated behaviors, on the other hand, are usually carried out just to get a reward or some desirable outcome. When children are engaged in play, they are learning and enjoying every minutes of it. All three of these views – cognitive discrepancy, competence/mastery, and attribution – are needed to explain motivation in play (Rogers & Sawyers, 1992).

Children play not because they know it will help them learn, but because they have fun doing it. When it stops being fun, children stop playing (Ostroff, 2012). Play is a wonderfully natural and spontaneous setup for learning. Children have an inclination to play as a means of exploring and being inventive, creative, and curious. The motivational forces of play cannot be overstated (Rogers & Sawyers, 1992). Children are highly motivated to play because they enjoy it, and that is the power of play for cognitive growth. In play, children can hypothesize or imagine many possible new situations, while creating responses to stretching ideas, theories, and behavior patterns. The satisfaction of 'being good at' something also has adaptive significance for cognitive growth. In the process, children learn about the world. The inner motivation is important for effective learning.

Third, **Active Behavior**. Play is first and foremost a voluntary activity. During play, children involve and concentrate on play. They explore, manipulate, and interact with many kinds of objects, toys and friends and adults. It make them become learn about the world. Exploration in children sets them up to learn. Children who are engaged in play are actively involved. Children cannot be passive recipients of play. When children's action and awareness merge, they become autonomous thinkers, not robots. The play-based curriculum values and promotes child-initiated individuality and autonomous thinking (Rogers & Sawyers, 1992).

Piaget refers to the intentional social process of constructing understanding as active education (DeVries & Kohlberg, 1987). Active education involves four elements; interest, play, genuine experimentation and cooperation. The interest, experimentation, and cooperation are joined within the context of play. Children first examine the kinds of play and the relation of these kinds of play to active education. Then, they place these kinds of play into particular learning contexts, intending to show that through play, children achieve all the elements of active education through play. When children are interested and applying attention to their play, they are engaging in active education. If, however, their play involves a simple manipulation of materials, without applying mental activity, it is unlikely that knowledge construction will take place. Little understanding can occur without interest, experimentation, and cooperation. Play offers the child the opportunity to make sense out of the world by using available tools. Understanding is created by doing, by doing with others and by being completely involved in that doing. Through play, the child comes to understand the world and the adult comes to understand the child (Chaille & Silvern, 1996). The elements of interest, experimentation, and cooperation must be present on order for active learning, or understanding, to occur through play (Chaille & Silvern, 1996). Children are active learners. They explore and handle objects every day.

Forth, **Concrete Experience**. Child-directed play makes children experience concretely. Through play, children can interact with his or her environment and increase cognitive and social awareness. Piaget believed that play serves an important cognitive function. It supplies children with numerous opportunities to assimilate and accommodate new information (Ness & Farenga, 2007). Play is essential for cognitive development. Because play offers numerous opportunities for children to act on objects and experience events (Rogers & Sawyers, 1992). Children learn through a combination of physical experience, social experience, and reflection (Kostelnik, Soderman, & Whiren, 2007).

All learning begins with perception: seeing, hearing, touching, tasting, and smelling. Thus, children learn best by using all their senses (Bredekamp & Copple, 1997; Hendrick, 2003). Because most researchers agree about the importance of hands-on learning, every activity for young children would naturally include a high level of sensory engagement by children (Kostelnik, Soderman, & Whiren, 2007). The most effective means of sensory engagement is firsthand experience. This means we must consider ways to give children direct contact with real objects, people, places, and events (Marzano, 2003). If no firsthand experience is possible, seriously reconsider whether the activity is age appropriate. The younger the children, the less valid is relying on secondhand experience rather than firsthand involvement. As children mature and express curiosity about people, objects, and events somewhat removed from their immediate experience; continue to plan activities that provide the maximum sensory involvement, keeping the following guidelines in mind: firsthand experiences are best, firsthand experiences should proceed representational or more abstract experiences (e.g., show real fruit prior to pictures of fruit), models are more concrete than pictures; pictures are more concrete than words, and plan activities so that sensory engagement occurs early in the procedure rather than later (Kostelnik, Soderman, & Whiren, 2007).

Fifth, **Symbolic Transformation**. Play enables children to transform reality into symbolic representations of the world (Rogers & Sawyers, 1992). A younger child usually uses an object based solely on its literal purpose. But as the preschool child develops the ability to separate purpose from usage, he or she may begin to use the block as an airplane or truck. Thus the child's imagination leads the activity. When children engage in symbolic play, they use mental representations, thereby allowing one objects to stand for another. A major cognitive shift occurs as children's actions arise from ideas or imagination, moving beyond the literal purpose of playthings. Using imagination is the first sign of the child's ability to think in more symbolic terms versus concrete or literal interpretation. Because imaginative play involves symbolism, such play facilitates the development of symbolic and abstract thought (Nell, Drew, & Bush, 2013; Wellhousen & Kieff, 2001). Symbolic play marks the beginning of representational thought through the use of substitute objects or actions (Rogers & Sawyers, 1992).

According to Vygotsky (1979) a child's greatest self-control occurs during play, since play requires acting against real-world knowledge. A child must put aside what he or she already knows about a stick to allow it to become a horse, for example. Because playing is by definition liberated from real-world consequences, children in play can be free to experiment and take risks that they might not take in other circumstances. Such risks are crucial to learning (Ostroff, 2012).

Sixth, **Repetition**. Almost everyday children play and play repeatedly. In repetition, effective learning is occurring. One basic premise of early childhood education is that children learn through repetition. Real learning does not occur in a single episode. Children need many opportunities to engage concepts, explore ideas, and try out skills to gain mastery. In other words, children need a chance to practice what they are learning and to utilize what they learned in new situations (Slentz & Krogh, 2001).



Practice takes a variety of forms (Freiberg & Driscoll, 2005): Rehearsals, repeating an activity with variation, and elaborations.

a) **Rehearsals** (e.g., children hear a story several times, then help the teacher tell it before telling on their own; children rehearse answering the phone in the housekeeping area).

b) **Repeating an activity with variation** (e.g., children sort shells one day, sort fruits and vegetables another day, and sort rocks a third day)

c) **Elaborations** (e.g., children associate a current skill or even with a previous one, for instance, the children recognize that the process of recording observations of the fish in the aquarium today is similar to the observation records they made last week about insects outdoors) (Kostelnik, Soderman, & Whiren, 2007).

Practice is most beneficial when the conditions under which it occurs vary slightly from one time to the next. Relevant practice episodes may occur within a day or during several weeks' time (Kostelnik, Soderman, & Whiren, 2007).

#### What are the teacher's roles to encourage play?

Young children's teachers should regard play as an integral part of the curriculum. Teacher's roles are as follows: First, set the stage for children's play. The teacher is responsible for establishing conditions that accept and encourage play. a) Provide enough time for children to develop their play. Longer time periods may be necessary for children 'to become involved in mature, complex forms of play'. B) Provide adequate space for children. Occasionally furniture may need to be moved, or room made for miniature plat sets. Careful planning and organization of play settings in order to provide for and extend learning are needed.

Second, emphasize the process rather than the product. This will be aid in developing children's creativity, but even more importantly will ensure that children feel competent and good about their own work. And therefore will be self-motivated to continue to learn.

Third, carefully observe when teacher is needed. Sometimes teacher might need to participate, just elaborate or to extend the play. Other times teacher can facilitate the play. Carefully observe what children really need, and then offer just enough to get them on the right track.

Forth, encourage children's involvement. Children new to the group or those who are less socially capable may need a bit of assistance to join in. Maybe the circus clowns or someone to sell hotdogs could be a good involvement. Offer a prized prop, such as a firefighter's hat, and see how the child's confidence soars when a fire suddenly breaks out.

Fifth, support children in their problem solving, and encourage them to expand the number and diversity of potential solutions. Teachers should not arbitrarily announce "That won't work!" before a child has had a chance to think about his or her plan. a) Attempt to grasp the child's intent. b) Ask about alternatives children considered ("Tell me what you thought about doing...Anything else?"). c) Inquire about the possible sources of information ("Has anyone done anything like this before? Might he or she help?"). How can we do this? Rather than probing for one specific answer, encourage children to try out, or think of, multiple solutions (Kostelnik, Soderman, & Whiren, 2007; Rogers & Sawyers, 1997).



#### DISCUSSIONS

Play is central to childhood learning. Play promotes learning, and guided play is a powerful teaching tool. For children, play is at the heart of early understandings about the natural worlds, mathematical concepts, literacy, and social and emotional competence. Play is optimally useful pedagogical strategy, fully realizing the heterogeneous effects on young children's development, learning, and their school readiness (Kostelnik, Soderman, & Whiren, 2007; Nell, Drew, & Bush, 2013; Singer, Golinkoff, & Hirsh-Pasek, 2006).

All areas of development are enhanced through children's play activities. Play is the fundamental means by which children gather and process information, learn new skills, and practice old skills (Fromberg, 2002). Within the context of their play, children come to understand, create, and manipulate symbols as they take on roles and transform objects into something else. Children explore social relationships, too-experimenting with various social roles, discovering points of view in contrast to their own, working out compromise, and negotiating differences. Play enables children to extend their physical skills, language and literacy capabilities, and creative imaginations. Play provides for the release of tensions and the expressions of emotions. As a result, play is central to childhood learning (Kostelnik, Soderman, & Whiren, 2007).

As children play with adults, they learn new vocabulary, understand culturally determined rules and roles such as how to treat one another, and build important emotional connections. When they play with their peers, they learn that others have perspectives, rights, and feelings that may conflict with their own. Playing with others is how children learn reciprocity and mutual respect, essential traits humans need to coexist in a peaceful world (Anderson, Spainhower, Sharp, 2015).

Rich play experiences are developmentally appropriate opportunities for children to build self-knowledge and understanding of the world around them (Nell, Drew, & Bush, 2013). Play is, indeed, the true work of childhood. When we observe carefully, it tells us what children know and what they are thinking about, what they are wondering, testing, and predicting, and what skills they are ready to master. Play touches on every aspect of development and learning. And then we, as teachers, can plan and support their development and learning (Rogers & Sawyers, 1992; Schwarz & Luckenbill, 2015).

Play is seen as contributing to 'Quality Learning' because it provides the ideal conditions in which to learn (Bennett, Wood, & Rogers, 1997). These ideal conditions include spontaneity, inner motivation, active behavior, concrete experience, symbolic transformation, and repetition. Play provides relevant meaningful experiences, which allowed the children to exercise autonomy and take responsibility for their own learning. Play enables children to identify and follow their needs and interests, which revealed insights into their behavior, learning, and development (Bennett, Wood, & Rogers, 1997).

Play is self-chosen, children bring their prior knowledge and experience into the play episode, are able to monitor the amount of challenge present in an environment, and thus extend their learning (Wellhousen & Kieff, 2001). In addition, play is the heart of developmentally appropriate early childhood programs and, therefore, should be at the center of every curriculum. Play is essential for optimal development and learning (Hoorn, Scales, Nourt, & Alward, 1999).



Bowman, Donovan, and Burns (2001) found that children in the 'direct instruction' program had higher rates of delinquency, were less willing to help other children, and were more likely to experience emotional problems. Hart, Yang, Charlesworth, and Burts (2003) confirmed these findings in a longitudinal study that directly compared children who received developmentally appropriate practices. Results showed that children receiving direct instruction experienced more stress than children receiving developmentally appropriate practices experienced higher levels of academic achievement, scoring higher on receptive language, mathematics, and reading in elementary school (Singer, Golinkoff, & Hirsh-Pasek, 2006).

Play enables children to learn about learning – through curiosity, invention, persistence, and a host of other factors. Children's attention spans are amazingly long when they are interest. Children become self-motivated learners. Play reduces the pressure or tension that associated with having to achieve or needing to learn (Rogers & Sawyers, 1992). In play, children are much freer to incorporate new knowledge at their own rate and in their own way. This reduces the inevitable tension and anxiety that inhibit learning (Rogers & Sawyers, 1992).

The cycle of frustration, failure, and lack of interest in learning can also result when children's early school experiences are not developmentally appropriate or when they have little or no relation to the children's interests, needs, and goals. As adults, we are often reluctant to relinquish the control over the learning situation to children. Many of us are more comfortable when we are directly teaching than when we act as facilitators for children's play. But we must allow children to play if they are to learn (Rogers & Sawyers, 1992).

Therefore, teachers should consider play as the most effective teaching-learning method of the curriculum and they should encourage children to play in many ways. Teachers are essential to their children's learning and development. By providing children with developmentally appropriate materials and support, teachers can promote children's play and learning. Teachers' interest and encouragement will reinforce children's self-motivation and pride in their play.

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# "The research was supported by a grant from 2015 International Academic Exchange Program of Andong National University"



## The Relationship Between Sexual Satisfaction, Marital Conflicts and Cognitive Emotion Regulation in Women Victims of Violence in Savojbolagh- Iran

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#### ABSTRACT

Unfortunately, numerous factors may affect health of individuals as well as family health; violence can be named as one of these factors. The most common form of domestic violence is violence against women. The purpose of this study was to examine the relationship of sexual satisfaction with marital conflicts and cognitive emotion regulation in women victims of violence.this is a correlational study and statistical population of research consists of all women referring to healthcare centers in Savojbolagh, Iran during 2017. Sample members were selected using convenient sampling method from women who had referred to these centers in order to receive healthcare centers. First, women filled out the spouse abuse questionnaire and then 100 women victims of violence signed the consent and filled out Sanai's Marital Conflict Inventory (2000), Hudson et al Index of Sexual Satisfaction (1981) and Cognitive Emotion Regulation Questionnaire (CERQ-P). Correlation m and multiple regression method were used for data analysis. Results showed a negative and significant relationship between sexual satisfaction and cognitive emotion regulation (P<0.05).Considering the results obtained from study, women victims of violence have lower sexual satisfaction, higher marital conflicts, and lower cognitive emotion regulation. It means there is a relationship between lower sexual satisfaction, more conflicts and lower cognitive emotion regulation in women victims of violence.

Key Words: Sexual Satisfaction, Marital Conflicts, Cognitive Emotion Regulation, Women, Victim of Violence

#### INTRODUCTION

Family is the first life center for individuals also is one of main society pillars. Health of society depends on the healthy situation of family and family health is related to health of family members including their mental health and having good relationship with each other (DHL, 2000). Unfortunately, numerous factors can affect health of individuals as well as family health; violence can be named as one of these factors. The most common form of violence in family is violence against women (Razaghi, Parvizi, Ramezani, &Nejad, 2013) that is indeed a serious threat for health of person and definitely can negatively effect on life aspects. According to studies on healthy people (2010), domestic violence is introduced as global epidemic and some methods are recommended for screening, prevention, and treatment (Schuiling&Likis, 2006). World Health Organization has defined violence as the intentional physical force, threat or action toward self, others or any other group and community that each may lead to strong probability of injury, death or mental harm (WHO, 2002). Violence of men against women causes numerous problems for victim and family members (WHO, 2002; Maghsoodinasab&Ibrahimi, Bahar 2015).

Relationship between couples is the most significant life scope affected by violence so that increased marital conflict is one of consequences of violence. Conflict is defined as disagreement between two persons. In opinion ofHaford (2001), marital conflict consists of continuous and important dissatisfaction of at least one of couples in their marital relation and such dissatisfaction may effect on function and quality of their relationships (Fani&Fani, 2015).Faverz and Elsoun (1992) named individuals that were dissatisfied with personality and habits of their spouse with communicational problemsas conflicting spouses (Heidari, Zakernejad, Delawar, 2009).

Cognitive regulation style of person plays a vital role in stressful situation management. Thompson defines cognitive regulation as internal and external processes that monitor, evaluate and change emotional reactions that consist of cognitive, emotional, behavioral, and physiological responses that occurs automatically within a conscious or unconscious process that not only concentrate on negative affects but also on positive affects ((Mashhadi, Hasani, &Mirdoraghi, 2012). Emotional regulation helps human to manage emotions after experiencing various conditions. There is a strong relationship between regulation strategies and mental pathology so that use of maladaptive strategies lead to mental harms and use of health regulation strategies such as positive re-evaluation can contribute to optimal stressful situations management (Hasani, 2010).

The significant concept in marriage in marital satisfaction that is mental and unique concept (Winch, 2002). Marital satisfaction indicates the situation in which couples see their current marital situation matched with their expected situation in life; in fact, marital satisfaction is a general evaluation of current relationships between couples (Siah Bahrami, Etemadi &Modebi, 2010). Olson (2000) points to three scopes of marital satisfaction including satisfaction with family life, satisfaction with marriage, and satisfaction with life in genera (Salehian, Sadeghi, Bahrami &



Sharifi, 2010).Schumacher et al. (2005) believe that adoption between couple is the most significant factor in marital satisfaction (Schumacher & Leonard, 2005). Quality of marital satisfaction effects on their sexual satisfaction; in fact, couples with unresolved conflicts are separated emotionally and experience low marital and sexual satisfaction. Sexual satisfaction consists of judgment of person about her/his sexual behavior (Sadeghi, 2001). Results obtained from a study conducted on 8500 women indicated that sexual orgasm in women not only depends on sexual compatibility but also on their general satisfaction with marital relationships so that frequency of orgasm and sexual relationships will be reduced in case of marital conflicts (Amrollahi, Chelci&Azin, 2013).

Considering the high prevalence of violence against women and its negative consequences in Iran, this study was conducted to determine relationship between violence and marital conflicts, sexual satisfaction, and cognitive regulation.

#### METHODOLOGY

This is a correlational study and statistical population of research consists of all women referring to healthcare centers in Savojbolagh, Iran during 2017. Sample members were selected using convenient sampling method from women who had referred to these centers in order to receive healthcare centers. First, women filled out the spouse abuse questionnaire and then 100 women victims of violence signed the consent and filled out Sanai's Marital Conflict Inventory (2000), Hudson et al Index of Sexual Satisfaction (1981) and Cognitive Emotion Regulation Questionnaire (CERQ-P). Data Extracted were analyzed through SPSS23 Software.

#### **INSTRUMENTS**

Following questionnaires were used in addition to demographic questionnaire:

**Ghahari Spousal Abuse Questionnaire :** this questionnaire consisted of 44 items including emotional abuse (20 items), physical abuse (10 items), and sexual abuse (14 items). Physical abuse such as beating and any kind of physical harm; emotional abuse such as humiliation, not meeting economic and mental needs, mocking and any kind of disruptive behaviors; sexual abuse such as any action that is uncommon within a sexual relationship such as violent sex or forced sexual relationship. Internal validity and reliability of this questionnaire obtained to 0.92 and 0.98, respectively (Ghahari et al, 2008, Ghahari et al, 2009).

**Marital Conflict Questionnaire:** this is a 42-items instrument using to measure 7 dimensions of marital conflicts including reduced collaboration, reduced sexual relationship, increased emotional reaction, increased demand for children's support, increased personal relationship with relatives, reduced family relations with relatives and friends of spouse, and separating form each other financially. Content validity of this questionnaire obtained to a good level. Each item is scored based on a 5-point Likert scale so that higher score is equal to higher conflict and reverse. Reliability of this questionnaire obtained to 0.94 using Cronbach's alpha in a study conducted on a 30-member group (Afkhami, Bahrami, &Fatehizadeh, 2007).

**Index of Sexual Satisfaction (ISS):** this index was designed by Hadson et al. (1981) to evaluate satisfaction levels of spouses consisting of 25 items. Responses are scored based on 5-point scale (1=always, 2=most of the time, 3=sometimes, 4=rarely, 5=never) so that minimum and maximum scores obtained to 25 and 125, respectively. Questions 1, 2, 3, 9, 10, 12, 13, 16, 17, 19, 21, 22, 23 were scored reversely. High score in this scale indicates sexual satisfaction. Reliability coefficient of Cronbach's alpha and retest (within one week) reported to 0.91 and 0.93, respectively. Cronbach's alpha coefficient of this scale obtained to 0.94 and its reliability reported to 0.85 in Iran using split-half method (Zadeh& Poor, 2016).

**Cognitive Emotion Regulation Questionnaire (CERQ-P):** this questionnaire conceptually distinguished 9 different dimensions of cognitive regulation including self-blame, acceptance, positive refocus, rumination, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and other-blame. Score interval was from 1 (almost never) to 5 (almost always). Each subscale consisted of 4 items. Total score of each subscale obtained through adding item scores. Therefore, score range of each subscale was between 4 and 20. High scores in each subscale indicated the greater use of mentioned strategy in coping with stressful and negative events. Persian version of CERQ-P was normalized by Hasani. In this study, reliability of scale obtained using internal consistency method (Cronbach's alph of 0.76-0.92) and retest (at correlation range of 0.51-0.77) and validity of this questionnaire



reported at good level through analyzing the main component using Varimax rotation and correlation between subscales (at correlation range of 0.32-0.67) (Hasani, 2010).

#### FINDINGS

This study was conducted on 100 women victims of violence considering variables of sexual satisfaction, sexual conflicts, and cognitive emotion regulation. Demographic information of studied samples (table 1) indicates prevalence of illiteracy among women victims of violence (89%) and among their husbands (92%). According to the job status of women victims of violence, most of these women (65%) and their husbands (49%) were workers; 22% of these women and 14% of their husband were unemployed (without income).

According to the mean and standard deviation obtained in this research (table 2), women victims of violence obtained 143.89 and 28.80 as mean and standard deviation, respectively in case of marital conflict and obtained 83.27 and 15.857 as mean and standard deviation, respectively in case of sexual satisfaction. Mean score of respondents indicated a negative relationship between sexual satisfaction and marital conflict while mean score of sexual satisfaction had a direct relationship with mean score of respondents related to cognitive emotion regulation. **Table 1. Demographic data of women victims of domestic violence (frequency and frequency percent)** 

		N	frequency	frequency		
				percent		
education level	below diploma	100	45	45		
	BA and above		44	44		
			11	11		
job	unemployed	100	22	22		
	employee		65	65		
	other jobs		8	8		
			5	5		
husband's	below diploma	100	68	68		
education	BA and above		24	24		
	DA and above		8	8		
husband's job	unemployed worker	100	14	14		
	employee		49	49		
	other jobs		12	12		
			26	26		

	Ν	Mean	Std. Deviation
Sexual	100	83.2700	15.85786
satisfaction			
Marital conflicts	100	143.8900	28.80302
Cognitive	100	105.4100	18.40624
regulation			



According to the obtained results from Pearson correlation coefficient (table 3), there is a significant and negative (reverse) (-0.597) relationship between sexual satisfaction and marital conflicts at level of P<0.05. Correlation coefficient between other predictor variable (cognitive emotion regulation) and criterion variable is acceptable considering its coefficient of determination (0.238) that is lower than 0.7. Therefore, it can be stated that there is a positive and significant relation between these variables at level of 0.05.

Since correlation coefficient between variables does not consist of complete correlation, multiple regression method was used to analyze results.

Results obtained from ANOVA and statistical properties of regression using simultaneous method indicated significance of statistical model (tables 4 & 5).

(F1,98)=54/392 ,P<0/0005 ,R<sup>2</sup>A=0/350 (0/370F2,97)=30/109, P<0/0005 ,R2A=

Analysis of these results indicates that hypothesis 1 (model 1) can explain 35% of variance (Adjusted  $R^2=0.350$ ); since Sig=0.000 (P<0.05), it can be stated with 95% probability that there is a negative relationship between marital conflict and sexual satisfaction; hence, this variable can predict sexual dissatisfaction in women victims of violence. Results obtained from hypothesis 2 indicate that this model also can explain 37% of variance (Adjusted R2=0.370); since Sig=0.000 (P<0.05), it can be stated with 95% probability at significance level of 0.05 that there is a positive relationship between cognitive emotion regulation and sexual satisfaction; hence, this variable can predict sexual dissatisfaction in women victims of violence.

According to the results obtained from multivariate regression (table 6), a standard deviation from mean score of marital conflicts in women victims of violence leads to -0.597 reduction in standard deviation of sexual satisfaction among women victims of violence while this change rate is equal to 0.163 in case of cognitive emotion regulation. Therefore, it is concluded that marital satisfaction is stronger predictor of criterion variable (sexual satisfaction) compared to cognitive emotion regulation; hence, marital satisfaction can predict sexual satisfaction in studied sample.

# Table 3. Correlation matrix between sexual satisfaction, marital conflicts and cognitive emotion regulation in women victims of violence

X7 ' 1 1	Sexual		Cognitive
Variable	satisfaction	Marital conflicts	regulation
Sexual satisfaction	1.000	597	.238
Marital conflicts	597	1.000	130
Cognitive regulation	.238	130	1.000

## Table 4. Summary of regression model for sexual satisfaction, marital conflicts and emotion regulation in women victims of violence

Model	R	$\mathbb{R}^2$	Adjusted R <sup>2</sup>	SD error						
1	.597ª	.357	.350	12.78146						
2	.619 <sup>b</sup>	.383	.370	12.58379						

Table 5. Results of ANOVA for significance of the regression model in women victims of violence

Model	Sum of Squares	Df	Mean Square	F	Sig.
1	8885.863	1	8885.863	54.392	.000ª
2	9535.587	2	4767.793	30.109	.000 <sup>b</sup>

		non-standardized		standardized		
	model	В	standard error	В	t	Sig.
1	sexual satisfaction	130.599	6.543		19.959	.000
	marital conflicts	329	.045	597	-7.375	.000
2	sexual satisfaction		10.373		11.002	.000
	marital conflicts		.044	576	-7.165	.000
	cognitive regulation		.069	.163	2.026	.046

 Table 6. Results of multivariate regression (sexual satisfaction, marital conflicts, and cognitive regulation) in

 women victims of violence

#### DISCUSSION AND CONCLUSION

Results obtained from this study indicated a negative significant relationship between sexual satisfaction and marital conflicts and a positive significant relationship between sexual satisfaction and cognitive emotion regulation.

According to the results obtained from hypothesis 1, there is a positive and significant relationship between sexual satisfaction and marital conflicts so that an increase in marital conflicts between couples leads to reduced sexual satisfaction. Moreover, results showed that predictability of marital conflicts in relation with sexual satisfaction was at a high level. This finding was in line with results obtained from studies conducted by Soodani et al. (2015), Babu and Carbapenem (2009), Mohammadkhani et al. (2010), Raeesi and Hosseinchari (2012), Razaghi et al. (2013).

According to these findings, it can be stated that dysfunctional attitudes and beliefs lead to inappropriate perception of common issues between couple leading to increase in marital conflicts and violence of man against woman ((Larson & Holman, 1994) so that this violence is originated from unhealthy interactions between couples because of weak conflict dispute skills and communicational strategies for negotiation; in this case, when one of couples gets angry the other one cannot manage the situation and this leads to violence and reduce marital satisfaction (Enayat&Doost, 2012). Marital conflicts and violence among couples leads to decreased calmness and security in family and such stressful factors lead to disappointment and crisis as well as reduced marital and sexual satisfaction (Ruiz-Perez, Plazaola-Castano, & Rio-Lozano, 2007).

According to the result of hypothesis 2, there is a positive and significant relationship between sexual satisfaction and cognitive emotion regulation so that cognitive emotion regulation can predict sexual satisfaction in women victims of violence; in this regard, reduced cognitive emotion regulation leads to reduced sexual satisfaction and increased cognitive emotion regulation leads to increased sexual satisfaction. This finding is matched with results obtained from studies conducted by Vin Stin et al. (2012), Valsh et al. (2010), Hogus et al. (2007), and Zanarini et al. (1991).

It is concluded that defective cognitive emotion regulation leads to violent behaviors toward spouse. Violence toward spouse is a reaction to control emotions men with personality disorder (J.M.Ross, 2011). Such persons have problematic cognitive emotion strategies and since are not capable of managing their negative emotions, use some maladaptive emotion regulation strategies such as rumination, thought suppression, impulsive behaviors such as aggression and avoidance (Carpenter &Trull, 2013) and such strategies increase conflict between couple leading to marital conflicts (Bloch, Haase, &Levenson, 2014). The mentioned issue would effect on various aspects of marital life, in particular sexual functioning of couple and lead to sexual dissatisfaction.

According to the results obtained from this study, women victims of violence feel lower sexual satisfaction, higher marital conflicts and lower cognitive emotion regulation. In this case, there is a relationship between lower sexual satisfaction, higher marital conflicts and lower cognitive emotion regulation in women victims of violence.



#### ACKNOWLEDGEMENT

We appreciate all employees working in healthcare centers in Sovojbolagh, Iran who collaborated with use in this research.

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# The Relationship Between Teachers' Perceived Sense of Organizational Trust and Their Organisational Citizenship Behaviors

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## ABSTRACT

The aim of the study is to examine the relationship between the perceived sense of organizational trust and the organizational citizenship behaviors of teachers working in public elementary, econdary and high schools located in Elazığ and Bingöl. Participants were 564 teachers selected by the non-random sampling technique of purposive sampling. The results showed that male teachers have higher sense of organizational trust mean scores than females, and married teachers have higher sense of organizational trust mean scores than singles. A high, positive and significant relationship was detected between teachers' organizational citizenship behaviours and the subfactors of volunteering, conscience, helpfulness, and sportsmanship. A moderate, positive and significant relationship was also found between organizational citizenship behaviors and organizational trust, trust for the principal, trust for teachers, trust for parents and for students.

Key Words: Organizational trust, organizational citizenship behaviors, private and public school.

#### INTRODUCTION

The term of organizational citizenship behavior was firstly used by Organ and Bateman in 1983 (Giap et al.). Organ (1988) described the organizational citizenship behavior as an individual behavior on a volunteer basis which helps the organization to work efficiently and effectively, and added that the behavior can not clearly and directly be described by the reward system of the organization. (Organ, 1988; Organ, 1997; Dyne and Ang, 1998; Özdevecioğlu, 2003b; Polat, 2007; Bolat and Bolat, 2008; Burns and Carpenter, 2008; Yılmaz and Bökeoğlu, 2008; Polat, 2009; Baş and Şentürk, 2011). The organizational citizenship behavior scale that has been reformed by Organ, is classified as five dimensional. These are: Altruism; all the voluntary behaviors to help other employees in a task or a problem with the organization (Unal, 2003). Conscience; fulfilling the duties on a voluntary basis and beyond the role of behaviors which are expected of them. Sportsmanship behaviors make contribution to the efficiency and the activity of the organization by fighting off the problems with constructive opinions without tension and increasing the employees tolerability to the resulting adverse situations (İşbaşı, 2000). Organizational virtue; the employee should try to develop and state ideas about all matters related to the organization, instead of trying to be the person who is trying to adapt to the daily life without a question (Cinar, 2000). And volunteering/courtesy is trying to help other employees that are working in the same organization with a mission or a problem about the organization even if it is not obligatory (Kaynak, 2007). In this research, organizational citizenship behaviors are structured through above mentioned four sub-factors excluding the organizational virtue sub-factor.

Organizational trust can be described as organizational relationships and a behavioral network which composed by the organization members trust on the manager and organization itself (Tschannen-Moran and Hoy, 1998; Hoy and Tschannen-Moran, 1999; Tschannen-Moran, 2001). Trust includes the vulnerability which depends on the comfortableness of believing a person would not intentionally harm another person and taking risks (Hoy ve Tschannen-Moran, 2003). Trust is being disposed to the vulnerability of believing the other group is helpful, reliable, efficient, fair and open, as another group (Tschannen-Moran, 1998, 2001, 2003). Organizational trust has been described as a very important component for the effectiveness of the organizations (Tschannen-Moran, 2004; Baş ve Şentürk, 2011). It is not possible to approach about a healthy relationship and communication between the employees and managers, information sharing, organizational performance, participation and organizational effectiveness (Callaway, 2006). From where Samancı (2006) and Yılmaz (2009) stand, those who are working without organizational trust can not exhibit organizational citizenship behavior.



#### THE STUDY

In this study, the relationship between organizational trust and organizational citizenship behavior is being addressed by a screening method. Research has been performed in the second period of 2015-2016 school year with 564 teachers who are working at primary schools, middle schools and high schools in Elazığ and Bingöl. Purposeful sampling method has been used for this research. Scale of organizational trust: Wayne K. Hoy and Megan Tschannen Moran's "The Omnibus T-Scale" (The Conceptualization and measurement of faculty trust in schools) is used for this study. Scale consists of 44 objects. Total variance of the scale is 64.49%, reliability coefficient is ,966. Scale of organizational citizenship behavior: Organizational citizenship behavior scale which has been developed by Yücel (2006) is used. Scale consists of 18 objects. Total variance of the scale is 72.80%, reliability coefficient is ,938.

The purpose of this research is to study the relationship between the organizational citizenship behavior and organizational trust that the teachers who officiate at primary schools, middle schools and high schools perceive.

#### Sub-goals of the research

- 1. What is the level of the organizational trust and organizational citizenship behavior that teachers perceive?
- 2. Is there a significant difference between the demographic characteristics like gender, marital status, title and the city of duty and organizational trust and organizational citizenship behavior that teachers perceive?
- 3. What is the level and aspect of the organizational trust and organizational citizenship behavior that teachers perceive?
- 4. Is there any dependence between demographic variables like gender, marital status, age, seniority, title, specialty, place of employment, positions, the number of years he or she served in the same school and the organizational citizenship behavior and organizational trust that teachers perceive?

#### FINDINGS

a.What is the level of the organizational trust and organizational citizenship behavior that teachers perceive?

The mean and standard deviation values of the organizational trust and organizational citizenship behavior that teachers who are working at primary schools, middle schools and high schools perceive is given at Table 1. Results given at Table 1 shows that throughout the scale of organizational trust (x = 3.57), in the trusting the manager (x = 3.80) and trusting the teacher (x = 3.60) sub-factors the level of teachers trust is "mostly", in trusting the parents and students sub-factor, (x = 3.01) the level is "sometimes". The level of teachers organizational citizenship behavior is "always" in the sub-factors of volunteering (x = 3.24) and conscience (x = 3.34).

Variables n=564	x	SS
General organizational trust scale	3,57	,74
1. Trust Manager	3,80	,91
2. Trust teachers	3,60	,88
3.Parents and students trust	3,01	,82
General OCB Scale	3,41	,75
1. Voluntariness	3,24	,92
2. Conscientiousness	3,34	,85
3. Helpfulness	3,53	,88
4. Sportsmanship	3,57	,95

Fable 1	l: D	Descriptive	statistics
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**b.** Is there a significant difference between the demographic characteristics like gender, marital status, title and the city of duty and organizational trust and organizational citizenship behavior that teachers perceive

Variables	Gender	n	Х	SS	t	р		
1.Organizational trust	Female	253	3,49	,92	-2,589	,010		
a.Lower confidence factor for Teachers	Male	311	3,68	,84	_			
	Marital status							
	Married	368	3,66	,83	2,147	,032		
	Single	196	3,49	,96	_			

Table 2: Analysis on some variables with confidence organizational sub factor

If we are to examine Table 2, we can see that in the sub-factor of trusting teachers, male teachers point average of organizational trust is higher than female teachers and also married teachers point average of organizational trust is higher than single teachers. ANOVA analysis results of sub-factors of organizational trust and organizational citizenship scales and some variables are given at Table 3. Shown in Table 4, there is a significant difference between the perception of teachers which have worked in the same school for 6-10 years and 1-5 years on the volunteering sub-factor of organizational citizenship. To determine on which group the significant difference observed, Mann Whitney U test applied. The test showed that this significant difference is in countenance with the group of 6-10 years of working. In addition, Table 5 shows that there is also a significant difference between the teachers which have worked in the same school for 1-5 and 11-15 years on one of the sub-factors of organizational trust; trusting the manager. This significant difference is on behalf of the group of 11-15 years of working. Also, in Table 6, we can see that there is also a significant difference on one of the sub-factors of organizational trust; trusting the manager, between the teachers which have worked in the same school for 6-10 and 11-15 years. Again, this significant difference is on behalf of the group of 11-15 years of working. Furthermore, shown in Table 7, there is a significant difference between the perception of teachers which have worked in the same school for 11-15 years and 16-20 years on the trusting the parents and students sub-factor of organizational citizenship. This significant difference is on behalf of the group of 11-15 years of working.

Sub Factors	Seniority	n	x	Sources variance	of	Sum of Ranks	sd	Mean Rank	F	Р	Diffe rence
	1-5 year	236	3,57	Between		10,181	4	2,545	2,822	,024	
				groups					_		
	6-10 year	113	3,42	Between		504,258	559	,902			2-5
~				inside				_			
Sportsmanship	11-15 year	72	3,44	Total		514,439	563				
	16-20 year	77	3,63	_							
	21 year	66	3,88								
	and over										
E	Branch										
	Science	144	3,49	Between		4,571	2	2,285	3,130	,044	
	sciences			groups					_		
	Social	248	3,32	Between		409,575	561	,730			1-3
	sciences			Inside				_			
Conscientiousness	Classroom	172	3,25	Total		414,145	563				
	teachers										
V	Vorkplace	200	0.54	<b>D</b>					<b>-</b> 100	0.01	
<b>T</b> 11	City center	308	3,76	Between		11,741	2	5,871	7,188	,001	
Trust Manager	<b>D</b> ' <i>i</i> ' <i>i</i>	222	2.01	groups		450 101	561	017	_		0.1.0
	District	233	3,91	Between		458,191	561	,817			3-1,2
	Waint	22	2 10	Inside Tetal		460.022	5(2	-			
	Walst	23	3,18	Total		409,933	203	4.044	6 450	002	
I rust teachers	City center	308	3,60	Between		9,888	2	4,944	6,459	,002	210
				groups							5-1,2
	District	233	3 66	Between		429 445	561	765			
	District	255	5,00	inside		727,775	501	,705			
	Waist	23	2.97	Total		439 333	563				
Parents and	City center	308	3 10	Between		8 178	200	4 089	6.071	002	
students trust	eny center	500	5,10	groups		0,170	2	1,005	0,071	,002	1-3
students trust	District	233	2.93	Between		377 801	561	673			
	21501100	200	_,>0	inside		077,001	001	,070			
	Waist	23	2,58	Total		385,979	563				
P	lace of duty		,			,					
	Primary	200	3.79	Between		22.714	2	11.357	14.247	.000	1-2
Trust Manager	school	200	0,12	groups		,,	-	11,007	1.,2.,	,000	2-3
e	Middle	154	4,09	Between		447,218	561	.797			
	School		,	inside		,		,			
	High	210	3,59	Total		469,933	563				
	school		,			,					
	Primary	200	3,08	Between		10,097	2	5,048	7,535	,001	2.1.2
Parents and	school			groups							3-1,2
students trust	Middle	154	3,14	Between		375,882	561	,670			
	School			inside							

# **Table 3:** Organizational Trust With Some Sense and Sub-Factor ANOVA Analysis of Organizational Citizenship Regarding Variable Scale Results



	High	210	2,84	Total	385,979	563			
	School								
p<.05									
Tablo 4. Time	to do the sat	ne task	in the	Schools Sub	Factor Krus	kal-Wallis	s Test Re	sult	
Sub	Mission		n	Mean Ran	ik sd	χ2	p	Diffe	erence
Dimension	duration						-	MWU	
V. 1	1.5 year		438	253 52	1	6.032	.014	14902.000	1-2
voluntariness	1-5 year		150	200,02	1	-,	,	,	
voluntariness	6-10 year		82	297,77	1		,	p= ,014	

Tablo 5. Time to do the same task in the Schools Sub Factor Kruskal-Wallis Test Re	esult
--	-------

Sub Dimension	Mission	n	Mean Rank	sd	χ2	р	Difference
	duration						MWU
Trust Manager	1-5 year	438	231,76	2	8,064	,018	5368,000 1-3
	11-15 year	32	286,75	_			p= ,027

Table 6. Time to do the same task in the Schools Sub Factor Kruskal-Wallis Test Result

Sub	Mission	n	Mean Rank	sd	χ2	р	Difference			
Dimension	duration						MWU			
Trust manager	6-10 year	82	52,29	1	7,275	,007	884,500	2-3		
	11-15 year	32	70,86	_			P= ,007			

Tablo 7. Aynı Okulda Görev Yapma Süresi Alt Faktörü Kruskal Wallis Testi Sonucu

•		1							
Sub Dimer	Dimension Mission		n	Mean Rank	sd	χ2	р	Di	fference
		duration						MWU	
		11-15 year	32	25,47	1	6,285	,012	97,000	3-4
Parents	and	16-20 year	12	14,58				P=,012	
students tr	ust								

**c.** What is the level and aspect of the organizational trust and organizational citizenship behavior that teachers perceive?

		1 2		3	4	5	6	7	8	9	1	11	1	1	14	1	16	17	18	19
876 TOJ	ET:	The T	urkis	sh O	nline	Jou	rnal of	f Edu	catior	nal Te	chno	logy –	Z Dece	ט mber	2017,	Spec	ial Iss	ue for	TEC 2	2017876
L. OC	B	1.8	8.	.8	.8	.7	.3	.3	.2	.3	.1	-	.0	.0	.0	-	.0	.0	.0	.0
	2	- ,	19	9	8	2	,e 6	,e 1	,_ 9	,e 0	5	,0	3	,°	, o 60	,0	,°	,° 34	,0 84	,° 09
		(	6 (	0	2	5	6	8	3	6	3	36	2	8		8			*	
		:	* :	*	*	*	*	*	*	*	*					3				
		;	* *	*	*	*	*	*	*	*	*					*				
2. Malanta		1	,	,6 5	,6 2	,4 2	,3	,2	,2	,3 5	,1	-	,0	,0	,0 29	-	,0	,0 71	,0 04	-
voluntai	n			5 0	2 5	3 8	0	9	8 2	5 1	9	,0 14	0	0	38	,0 8	00	/1	94 *	,0 19
11055			;	*	*	*	*	*	*	*	*	14	2	2		2				19
			;	*	*	*	*	*	*	*	*									
3.				1	,6	,5	,3	,2	,2	,2	,1	-	,0	,0	,0	-	,0	,0	,0	,0
Conscien	nt				9	3	2	9	4	6	3	,0	1	4	75	,1	49	61	50	22
iousness					3	1	2	4	4	4	9	45	5	0		0				
					*	*	*	~ *	* *	*	*					2 *				
4					1	5	2	2	2	2	1	_	0	0	0	-	0	0	0	0
Helpfulr	ne				1	,5 9	,2 8	,2 6	2	,2 0	0	.0	,0 1	,0 5	,0 39	.0	,0 70	,0 13	,0 89	,0 25
ss						6	4	2	4	5	0	37	9	5		6			*	
						*	*	*	*	*	*					5				
						*	*	*	*	*										
5. Smortern						1	,2	,2	,2 5	,2	,0	-	,0 2	,0 7	,0	-	,0 24	-	,0 50	-
sportsm	a						0 7	1	5 6	8	0	,0 24	2 1	/ 0	40	,0 0	54	,0 57	39	,0 04
nsmp							*	*	*	*	0	24	1	,		5		51		04
							*	*	*	*										
6.							1	,8	,8	,7	,0	-	,0	,0	-	,0	-	-	,0	,0
Organiza	at							8	4	1	7	,0	5	3	,0	4	,0	,1	30	48
ional tru	st							4	8	5 *	5	50	7	2	08	2	60	11 **		
								*	*	*										
7. Tru	ıst							1	,5	,4	,0	,0	-	-	-	,0	-	-	,0	,0
Manager	r								6	8	0	04	,0	,0	,0	1	,0	,0	15	58
									4	7	7		1	2	28	4	11	97		
									*	*			1	5				*		
<u>о</u> Т.,,	ict								* 1	* 5	1		0	0	0	0			0	0
teachers	151								1	,5 4	,1 0	-	,0 8	,0 6	,0 17	,0 4	-	-	,0 24	,0 17
										0	9	90	3	3		9	51	, s 64		
										*	*	*								
										*	*									
9. Paren	its									1	,1	-	,1	,0 7	,0	,0	-	-	,0 52	,0
and											1	,0 45	0	/	07	4	,1 41	,1 20	53	45
trust											*	т.)	*	5		,	**	**		
											*									
10.											1	-	,2	,1	,0	-	,0	,0	,0	-
Gender												,1	2	8	31	,0	50	94	66	,0
												35 **	1 *	1 *		6		*		25
												<u>ጥ</u> ጥ	~ *	^ *		4				
11.												1	-	-	-	-	,2	.0	-	.0
Marital													,4	,4	,0	,0	65	33	,2	67
status													4	4	97	3	**		21	
													7	5	*	9				



	*	*						
	*	*						
12.Age	1	,8	,3	,1	-	-	,4	-
-		5	65	3	,3	,0	22	,2
		7	**	7	75	66	**	44
		*		*	*			**
		*		*				
13.		1	,4	,1	-	-	,4	-
Seniority			06	4	,4	,0	85	,2
			**	6	25	87	**	10
				*	**	*		**
				*				
14.			1	,0	-	-	,2	-
Degree				2	,1	,0	57	,1
				6	42	14	**	34
					**			**
15.				1	,0	-	,0	-
Branch					17	,6	87	,0
						92	*	25
						**		
16.					1	-	-	-
Workplac						,0	,1	,1
e						40	59	28
							**	**
17. Place						1	-	-
of duty							,0	,1
							71	29
								**
18. The same task in the Schools							1	-
								,1
								13
								**
19. Task								1
the								
provinces								
Correlation is significant at the 0.01 level (2-tailed).**	Co	rrelat	tion is	sign	ifican	nt at th	ne 0.03	5
level (2-tailed).*								

Examining Table 8, there is a positive and significant relation between teachers organizational citizenship behaviors and volunteering, conscience, helpfulness and sportsmanship sub-factors (respectively r=0.81, r=0.89, r=0.88, r=0.72, p<.01). Hereunder, while organizational citizenship behaviors are increasing, volunteering, conscience, helpfulness and sportsmanship also increase. When determination coefficient (r  $^2$  =0.66, r  $^2$  =0.79, r  $^2$  =0.77, r  $^2$  =0.52) is taken into consideration, we can say that total variance of organizational citizenship behavior derives from 66% volunteering, 79% conscience, 77% helpfulness and 52% sportsmanship, respectively. Pursuant thereto while organizational citizenship behaviors are increasing, organizational trust, trust in manager, trust in teachers, trust in parents and students also increase and gain importance. When determination coefficient (r  $^2$  =0.14, r  $^2$  =0.10, r  $^2$  =0.10) is taken into consideration, we can say that total variance of organizational citizenship behavior to the determination coefficient (r  $^2$  =0.14, r  $^2$  =0.10, r  $^2$  =0.10) is taken into consideration, we can say that total variance of organizational citizenship behavior derives from 14% organizational trust, 10% trust in manager, 10% trust in teachers and 10% trust in parents and students, respectively.



#### Table 8. Correlations between variables

c. Is there any dependence between demographic variables like gender, marital status, age, seniority, title, specialty, place of employment, positions, the number of years he or she served in the same school and the organizational citizenship behavior and organizational trust that teachers perceive?

Organizational citizenship behaviors of teachers are examined through the variables like gender, marital status, age, seniority, title, specialty, place of employment, positions, the number of years he or she served in the same school, and all variables are significant with organizational citizenship behaviors according to the multiple regression results. Regression analysis reports are given at Table 9. Table 9 shows that if we take a look at the partial correlation between predictor variable and dependent variable, there is a medium-level positive correlation between organizational trust and organizational citizenship behavior (r=0.36), however we can see that if the other variables are also taken into consideration, the correlation calculated as r=0.37. Moreover, there is a low-level positive (gender, age, seniority and place of work) and low-level negative (specialty) correlation between other independent variables and organizational citizenship behaviors but if the other variables taken into consideration, the correlation between the variables are calculated as: gender (r=0.10), age (r=-0.08), seniority (r=0.13), specialty (r=-0.11), place of work (r=0.12). With these variables, there is a mid-level significant relation with the organizational behaviors of teachers, R=0.424, R<sup>2</sup> =0.180, P<0.05. Again with these variables, 18% of the total variance of organizational citizenship behaviors can be described. For standardized regression coefficients ( $\beta$ ), the relative importance order of predictor variables on organizational citizenship behavior is: organizational trust, seniority, age, place of work and gender, respectively. However if the t-test results of the significance of regression coefficients have shown that organizational trust, gender, age, seniority, specialty and place of work variables are a significant predictor of organizational citizenship behaviors.

(11=304).							
Variables	В	Standa	art β	t	р	Zero-	Partial r
		Hata <i>E</i>	3			order r	
Constant	1,760	,206	-	8,527	,000	-	-
Organizational trust	,374	,039	,371	9,606	,000	,366	,377
Gender	,156	,061	,103	2,572	,010	,153	,108
Age	-,137	,065	-,158	-2,097	,036	,032	-,089
Seniority	,128	,040	,242	3,161	,002	,068	,133
Branch	-,109	,040	-,108	-2,741	,006	-,083	-,115
Workplace	,165	,057	,126	2,919	,004	,063	,123
R=,424	$R^2 = ,180$		F(6, 557) = 20,37	74	p=,000		

**Table 9.** Regression Model of Organizational Trust and Organizational Citizenship Behaviors (n-564)

#### CONCLUSIONS

In general of organizational trust scale, in the sub-factors of trust in manager and teachers, the trust level of teachers is "mostly". In trust in parents and students sub-factor, the result is "sometimes". Organizational citizenship behavior level of teachers is also "sometimes" in the sub-factors of volunteering and conscience.

In the trust in teachers sub-factor, male teachers point average of organizational trust is higher than female teachers and also married teachers point average of organizational trust is higher than single teachers. The perception of organizational citizenship behaviors on sportsmanship sub-factor is on behalf of the group which worked +21 years. Moreover, on conscience sub-factor, teachers perception of organizational citizenship behaviors are on behalf of the science teachers. On the sub-factor of trust in manager, the perception of teachers are on behalf of the ones who work at cities and town centers. Congruently, on the trust in teachers sub-factor, the perception of teachers are also on behalf of the ones who work at cities and town centers are only on behalf of the ones who work at cities. Again on the sub-factor of trust in manager, the perception of teachers are diversed to the ones who work at cities. Again on the sub-factor of trust in manager, the perception of teachers are only on behalf of the ones who work at cities.



schools. On the sub-factor of trust in parents and students, the perception of teachers are only on behalf of the ones who work at primary and middle schools.

A high, positive and significant relationship was detected between teachers' organizational citizenship behaviours and the sub-factors of volunteering, conscience, helpfulness, and sportsmanship. A moderate, positive and significant relationship was also found between organizational citizenship behaviors and organizational trust, trust for the principal, trust for teachers, trust for parents and for students.

With this study, the relationship between organizational citizenship behavior and organizational trust of teachers examined. Our findings show that it is important to determine the circumstances which are hindering the organizational trust of the teachers for organizational citizenship behaviors, and rearranging the social surroundings for achieving the goals of schools effectively.

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## The Rise of Artificial Intelligence in Design

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#### ABSTRACT

The fact that machine learning and artificial intelligence has seldom been applied to the field of design and 3D modeling is not very surprising, for the primary use of deep learning models until recently has been limited to problem solving, recognition, and research. However, recently multiple attempts to synchronize this prestigious technology with the design industry has been made. This paper will primarily discuss the genesis and general application of deep learning technology, with a special focus on the field of graphic design. Furthermore, this paper will address how the increasing role of artificial intelligence in the field of aesthetic and practical design will be able to solve related issues in the future.

#### **INTRODUCTION**

According to Data Nami, deep learning is a form of machine learning that can utilize either supervised or unsupervised algorithms. The deep learning model's prototype, dating back to decades before the 21<sup>st</sup> century, focused on creating an infrastructure of data algorithms that would be able accumulate information independently. Through decades of research, the software and hardware requirements to create such a digital infrastructure were satisfied. The multiple layers of a deep learning network can now allow computers to organize the data into a hierarchy using each previous layer as input to create a more advanced, sophisticated output. Therefore, the technology of making machines learn, think, and even create has been born.

Of the multiple reasons that the deep learning technology and its fruitful cousin -artificial intelligence- has been shunned, the primary one is perhaps what makes the technology so special: its structure and function resembles that of the human brain. As a matter of fact, the artificial neural network is modeled after an actual human brain neuron, Figure 1 below, in order to simulate the processes of the human brain.



Figure 1. (Retrieved from: https://appliedgo.net/perceptron/)

Similar to a human brain, deep learning uses previous data and experience to put out the best solution to a challenge. While the similarity had evoked a hunch of dystopian uneasiness to countless writers and technology conservatives, it has also become the main reason why deep learning applies to almost every field of human life. In fact, deep learning and artificial intelligence are one of the most prestigious spheres of technology in the 21<sup>st</sup> century: a technological evolution in the era of data. Today, it is hard to locate a business or individual who doesn't benefit from technology that is related to deep reinforcement learning. Image recognition, automatic speech recognition, and



AI secretaries in cell phones are only the tip of the iceberg amongst the vast possibility of the deep learning application. Rob Girling from the Artefact Group reports that in 2017, "the New York Times said that Carnegie Mellon plans to create a research center that focuses on the ethics of artificial intelligence. Harvard Business Review started laying the foundation for what it means for management, and CNBC started analyzing promising AI stocks" (Girling, 2017).

However, even in the vast ocean of possibilities, there are still some spheres that deep learning technology and artificial intelligence are at best, not welcome. Partially, such resistance has to do with the conception - and quite often a misconception- that AI is here to take away jobs from humans: the old fear of foreigners stealing work from the natives, but in this case, the foreigners are digital.

Another major concern is a bit more humanistic. In some fields in which creativity and wisdom are the highest virtue, deep learning and artificial intelligence have long been shunned for its "artificial" nature. Take the fine arts, of which the definition itself includes the term "human." Giants in music and film alike have long assimilated art and music to something that is intimately related to the human soul and emotion. Amiri Baraka had quoted that "Art is whatever makes you proud to be human" and Oscar Wilde "I regard the theatre as the greatest of all art forms, the most immediate way in which a human being can share with another the sense of what it is to be a human being." There is no wonder why it may seem strange, even blasphemous, that AI is on the verge of taking human's mantle as a creator.

Regarding such blasphemy, the art of design cannot escape similar accusations. Design, from its birth, has always been praised as it demanded both creativity and social intelligence that, conceivably, only humans may create and control, not to mention that effective design does not only have aesthetic value but also has considerable influence on human life. On the verge of the rise of design related artificial intelligence, critics are debating whether design industry should welcome or reject the help of the AI. Some critics argue the entry of deep learning technology will "steal" amateur design jobs and eliminate the lower end of the market, while some oppose such "jump to conclusions." Some designers and technology authorities hope that the application of artificial intelligence in the field of design may yield more variable, prosperous outcomes in the area. For instance, AI's adaptations to the field of design in the past few years has resulted in programs and apps such as Prisma and Albert, in which deep learning algorithms play a significant role in enhancing and recreating less presentable photos and drawings (Hudelson, April 2017).

Rob Girling agrees that design jobs are defined by creativity and social intelligence. However, the ability to complete the task of problem framing, problem-solving and negotiation is not a trait limited to human beings. The primary mission to stay competitive, he asserts, is to have "additional knowledge and expertise to contribute in multidisciplinary contexts, perhaps leading to increasingly exotic specializations." Girling believes that the vast usage and of the big data and the fluent implications abled by the modern evolution of deep learning may become the key to AI's active participation in design, without pushing human designers and workers out of their jobs. "(AI driven programs) enables designers to quickly and easily create millions of variations of design...With increased productivity and better tools, it will be easier for amateur designers to create acceptable -if not exceptional- work." With such dramatic increase in efficiency and productivity, designers are granted a significant amount of time to think and creative more professional, polished work. Designers, instead of concentrating on the repetitive design, can now work on illustrating the creative aspect uplifting the ceiling of design to another level.



Girling views AI as a competitive force that will focus on aiding human professionals to help them achieve what they cannot work alone. In concluding his essay, he writes that "I can see the potential for a future where our personal AI assistants, armed with a deep understanding of our influences, heroes, and inspirations, constantly critique our work, suggesting ideas and areas of improvement." Similarly, various prototypes of virtual blueprints and 3D design have risen to the surface. Perhaps the progression of this new technology is yet to galvanize the area of design: and furthermore, every corner of human life.

#### PROPOSAL

#### AI in Urban Planning and Architecture.

Through extensive data mining, AI learns information of and patterns within societies. With this advantage, artificial intelligence would be able to present architecture and urban renovation plans according to the population's overall hobbies, activities, yearly income, age groups, etc. Such architectural planning may also be available for small groups and individuals, creating tailor-made buildings and homes according to various needs and wants.

Furthermore, AI specialized in aesthetic design has outstanding prestige in urban artistic architecture. For example, the London-based AI Build program created and unveiled the Daedalus Pavilion at the GPU Technology Conference of 2016. Despite that it was planned and created solely by artificial intelligence, this 3D printed piece was deemed stunning by numerous critics and costed significantly less than human-made architecture. Similarly, AI's capabilities to create aesthetic and practical structures will play a significant role in creating urban plans and architecture in the future, with acceptable budgets and design.

#### THE STUDY

The introduction above has summarized the structure of a broad learning mechanism as "an artificial brain." While such a description would be, in concept, correct, there is much more to discuss when it comes to a more technical description. Deep learning is a form of data learning that is carried out by a neural network, or a system designed to the function of neurons in the human brain. The unusual design of an artificial neural network allows it to process and learn considerable amounts of data and grants it astonishing flexibility in application and adaptation.



Figure 2. (Retrieved from <u>https://jaygshah22.quora.com/Neural-Networks</u>)

A neural network usually consists of multiple layers, or processors that operate in layers (Figure 2). The first layer receives the raw input of data, and each following tier process the data to calculate and comprehend the value of the information. It may be said that the layers function as nerves and neurons in the human body, for they serve similar functions of receiving and transmitting data. There usually exist three types of layer, each with different functions: the input, the hidden, and the output layer.





#### Figure 2.

(Retrieved from https://medium.com/the-data-experience/building-a-data-pipeline-from-scratch-32b712cfb1db) Each processor, or node, consists of independent, abstract knowledge that is either programmed or actively gained on its own. The layers composed of such processors are densely interconnected, which results in the biggest characteristic and advantage of the neural network: its adaptability. As the neural network modifies itself to the continual training and test data it processes, it learns to weight or the importance of each input data. For example, if constant images and such data about a cat's face were inserted into the network's layers, the neural network would soon establish a data set of recurring characteristics such as mustaches, curved mouths, and furry, often round faces (Figure 2). This grants the neural network to define objectives and make determinations, resulting in a powerful, flexible, and even independent artificial intelligence.

Neural networks have been initially designed to able more human-like knowledge and flexibility in machines. This purpose has made it a forerunning technology in creating artificial intelligence. Due to its broad possibility of applications, deep learning in neural networks has, over just a few decades, evolved significantly and now is on the brink of adapting to almost all the main spheres of human life.

#### IMPLICTAIONS FOR EDUCATION AND TEACHERS

The difficulties of adapting AI to the role of the teacher or the tutor must not conclude the search for possibilities in the field of education. As this paper has illuminated, the possibilities that CNN holds in processing and discovering characteristics and images are magnificent, and will lead to fruitful applications in the future.

It must be noted that the potentials deep learning and artificial intelligence hold, if developed enough, will bring major changes in future design curriculums and classrooms. It is incredibly important for researchers and educators alike to realize such potentials of the machine learning technology and begin to create more refined digital mechanisms, mine new data, and further enhance policies that will allow its fruitful and effective utility in the future (Luckin, et. al 2016).



#### CONCLUSIONS

Not surprisingly, the recent application of deep learning in the field of arts and design has met considerably more criticism than those in other areas. Such a tumult may result from a zealous rage from seeing computers and robots invade into the sacred ground of aesthetics and intimacy with daily individual life, or from an uncomfortable shattering of the assumption that the profession of design would be safe away from all the technological frenzy.

It is, of course, overtly naïve to consider that artificial intelligence's function in the design industry will end as a secretary, or a think tank full of data and useful information. However, it is equally absurd to announce that machines are now the suppliers of humans' thirst for beauty – better or not, creations by artificial intelligence are nothing more than rearrangements of those of our own. Rather, most researchers suggest viewing deep learning technology as any other technology: an extension of human labor that focuses on making life easier. Furthermore, as does that of any technology, the prospect of deep learning's use and value lies solely in the hands of its makers.

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# The Rise of Artificial Intelligence in Economics Theory

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## ABSTRACT

The rapid growth of the technology market relating to deep learning and artificial intelligence during the last decade has been breathtaking. The increasing utility of deep learning in various spheres of life has profoundly impacted the general opinion of how far this surprising technology would intervene in human life. This paper addresses the methodology of using deep learning to resolve various issues in the field of economics with particular attention to the use of neural networks. Specifically, it will be looking at the current and the future use of deep learning in the field of business and economics, noting the breakthroughs and possible limitations in the process. Specifically, in my project, this paper will be looking at the use of Deep Learning to drive the changes in economic theory.

#### **INTRODUCTION**

In 2016, Google purchased and integrated a deep-learning based translating program upon its corporate software. Similarly, IT Behemoths such as Apple, Samsung, Facebook all show a fanatic willingness to invest an astronomical amount of funds into what is now a gold mine of technologies. The enterprise funds that had been \$220 million in 2015 has skyrocketed and is foreseen to jump over \$11.1 billion in 2025 easily. Indeed, a gold rush has begun, and the prize is the key to the radiant door to the future: the technology of deep learning.

Deep learning is the technology of creating computational models that process and utilize multiple layers of representational data. As a sophisticated digital structure of piled information, the deep learning model primarily serves to classify intricate structures from a pool of already-existing data and form algorithmic predictions over new input. In this context, one could assert that the concept of deep learning parallels the function of a human brain, and rightly so: much like the human brain, deep learning allows the processing of images, audio, and functional data.

While deep learning's significance in the artificial intelligence industry had become stable in relatively recent years, the concept -and the early models- of utilized deep learning traces up to 1980, when electrical engineer Kunihiko Fukushima introduced neurocognition or a multilayered architecture that can define patterns through learning. In 1989, a neural network that relied on algorithms appeared, but although the algorithms were functional, the technology itself was deemed not due to various limitations both systematically and practically. Only after the century turned and the AI pioneer Geoffrey Hinton employed RBM -restricted Boltzmann Machine- to stabilize the neural network models, did deep learning resurrect as a legitimate "technology of the future."

Despite its staggering genesis, the legacy of deep learning has now hoisted itself upon firm ground of celebrity. Of the 10 Breakthrough Technologies of 2017 (MIT Technology Review, 2017) selected by the MIT Technology Review, four are closely related to machine learning and some form of data algorithm. Gartner, Inc has officially asserted that deep learning and artificial intelligence will stretch its influence over to almost every possible corner of society and life, including medical science, architecture, economics, education, and so on. Judging from the similarity deep learning shares with the human brain mechanism, such an assertion does not seem at all illegitimate: deep learning has indeed begun an era of technological transition: the digital industrial revolution.

Deep learning's compatibility with time-series data offers it a towering advantage over other digital technologies, especially in the field of economics. The continuous update of the big data grants digital algorithms to accompany the fast-paced changes in the stock market successfully and foresees the general financial trends and correlations among countless factors and society. Upon the almost omnipresent advantage of the big data, deep learning may even provide answers for all financial problems that have been and will be. This hugely beneficial characteristic of deep learning is one of the primary causes that software power plants and digital companies are now eager to invest great endorsement in the area.



However, some remain skeptical about the future impact that deep learning will have on such a variable field of economics. Such concerns are primarily based on the fear that deep learning yet lacks sufficiently in logic, abstract cognition, and management of unforeseen variables: all of which are the most substantial elements of the economic analysis. One of the biggest concern on the issue is that while deep learning allows a decision to be made in mere seconds, most deep learning systems systematically cannot explain the cause of their decisions: straightforwardly speaking, currently deep learning is incapable of making high-risk decisions. In the New Yorker, staff writer Raff Khatchadourian indicates the evident challenges highlighted during his interview on deep learning and artificial intelligence with Demis Hassabis, an AI researcher and neuroscientist. He quotes: "Hassabis was clear about the challenges...the system still fails hopelessly at tasks that require long-range planning, knowledge about the world, or the ability to defer rewards" (Khatchadourian, November 2015). Although admitting that deep learning has yet to meet its golden age, Hassabis ends the dialogue in a hopeful note, pointing out the endless prospect of potential development and the due rewards that could be just around the corner.

#### THE STUDY

The most concise and practical definition of a neural network, or an artificial neural network, was first provided by Dr. Robert Hecht-Nielsen in the 1980s. "A computing system made up of some simple, highly interconnected processing elements, which process information by their dynamic state response to external outputs" (Caudill, February 1989). While this description was coined when the evolution of deep learning technology was still in its most primal stage, it still stands as an apt explanation of a neural network's structure and primary function. Artificial Neural Networks, or ANNs, are processing mechanisms that are modeled after the structure of the human brain. As the human brain consists of multiple brain cells or neurons, the ANN is formed of layers of processor units that correspond with each other to transmit and utilize data. Therefore, a neural network is the prime method of creating a deep learning mechanism.



Figure 1.

Retrieved from http://colah.github.io/posts/2014-03-NN-Manifolds-Topology/

Neural networks are usually composed of layers, which include densely interconnected nodes that serve certain functions. The layers are separated due to their primary duties, usually into groups called the input, the hidden, and the output layer (Figure 1). The input layer communicates to one or more hidden layers, which in charge of the actual processing and evaluation of the inserted data.





#### Figure 2.

(Retrieved from https://www.researchgate.net/figure/241741756\_fig2\_Figure-2-Back-propagation-multilayer-ANN-with-one-hidden-layer)

To enhance their functions, most neural networks own a 'learning rule' that aids in evaluating the value of each data and establishing an abstract concept. Learning rules serve the same function as does the human brain when it gradually develops levels of information and guidelines through experience and stimulation. One of the prime learning rules is the back propagation (Figure 2) or the procedure of adjusting errors in the neural system. When the layers are presented with data, the backpropagation algorithm guesses the outcome. It then changes the connection values of the nodes to further enhance the accuracy of the neural network's calculations.

Unlike the conventional computer, the neural network is not sequential nor utterly deterministic in function. Rather, it concentrates on programming and responding to patterns and determining relationships between variables. Therefore, the neural network is more apt to capture data relationships and solve dynamic problems that are otherwise unsolvable. This towering advantage allows the neural network to indulge in various convoluted issues, and to adapt to various situations and fields.

#### APPLICATION PROPOSALS FOR ECONOMICS

I. Effective Fraud Detection

The increasingly common use of the internet leads to more valuable data, both private and corporate, stored and trafficked online. Daily Fintech reports that cybercrime in contemporary times "is estimated to cost the global economy 400 billion dollars" (Krishnakumar, July 2017).



Figure 3.

(Retrieved from https://www.cbinsights.com/research/top-acquirers-ai-startups-ma-timeline/)



While the orthodox fraud detection systems rely on complex mechanism and rules, they often overlook contemporary threats and risk factors. Utilizing deep learning, systems will be able to more effectively detect abnormal activities and attempts to breach security, utilizing the outstanding capability of realizing patterns and sorting out anomalies. Corporates such as Mastercard have already announced the utility of AI fraud detection programs (Figure 3), and have noted that their uses in the last few years have been greatly beneficial.

## IMPLICATION FOR EDUCATION AND TEACHERS

Scientists and researchers have long endured the criticism that artificial intelligence will never be a substitute for a teacher or a tutor. While this statement is currently correct, it is a folly to determine that machine learning will never play a role in economics education in the future.

This paper has addressed the advantages and potential uses of artificial neural networks, especially in fields that require mass classification. It has also illuminated the vast possibilities of adaptation. Educators must realize that through further years of development, artificial intelligence will assume substantial roles in how finance and economics is taught. Therefore, it is notably crucial that the digital systems, policies, and curriculums be innovated to greet the promising future of applied machine learning acting as teachers and tutors in the field of education.

### CONCLUSION

While the goal of creating a "complete" artificial intelligence parallel with that of a human being is yet to be achieved, deep learning is still one of the most vastly utilized technology in the 21<sup>st</sup> century. Despite its few limitations, the deep learning technology has expanded its market in the fields of engineering, economics, and even education.

Accordingly, business schools and corporations alike are starting to include working with machines and intelligent programs in their curriculums; it seems that the future in which humans and computers coexist is indeed nigh. Acknowledging what AI can do to generate more profit and adapting to the change by sharpening the skills to handle better and enhance its possibilities should be viewed as the principal virtue of working with AI in the future. Furthermore, moral values and principles in utilizing the technology will have to be established, for technologies indeed have the power to affect lives, and in cases of economics, money: lots of it.

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# The Rising Influence of Artificial Intelligence and Algorithms in Food Science

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### ABSTRACT

While deep learning models and hence artificial intelligence have progressed throughout past decades via various breakthroughs – the Boltzmann machine and Neural Networking – it may seem that the technology fixates upon programs such as visual and auditory recognition and basic problem-solving. However, thanks to deep learning's wide range of compatibility, the technology is now being vigorously explored by experts in the field of the food industry. This paper will address the development and general structure of the deep learning mechanism, with a particular focus on its applications in food science. Furthermore, it will discuss the current and future role of artificial intelligence in the food industry, and how this prestigious technology may be developed to profoundly change the methods of consumption and well-being in the 21st-century markets and homes.

#### **INTRODUCTION**

Scenes in which the protagonists are surrounded by machines that autonomously labor to benefit human life have already become something of a cliché in science fiction movies and novels. From decades back, authors and directors with brilliant foresight have dreamed of a future in which machines with artificial intelligence work, cook, fight, and care for us. These conjuring of imagination, through years of technological evolution, have now become a reality. Prototypes of self-driving automobiles are being utilized in almost every part of the US, while prestigious, intelligent secretaries embarked in cell phones aid everyday human life. The era of information sought the age of artificially intelligent machines: and this technology is here to stay, with the AI market expected to grow to well over \$5.05 billion in the year 2020.

The glorious feat of machine learning is greatly attributed to some extremely convoluted -yet simple in purposetechnologies. One of such is deep learning. As the name itself suggests, deep learning is a technology that enables computers to not only learn information, but also learn to store, assimilate, and apply information in the way that it is most beneficially utilized. The deep learning model consists of layers and layers of algorithms, stacked onto each other as neural tissues in the human brain: not a surprising choice of design, for the very purpose of the deep learning technology is enabling machines to think like the human brain. While the elevation of deep learning in the field of modern technology is considerably new, the idea itself isn't. In fact, deep learning model had already been designed and developed in the 20th century: to be more precise, the model was first invented by electrical engineer Kunihiro Fukushima in 1980. However, the idea of stacking data algorithms did not promptly bear fruit, due to limitations in both software and hardware. It took a couple of decades for the functional problems in the deep learning model to be eliminated by the Boltzmann Machine, and another few decades for it to progress enough to be synchronized with other technologies. Although it took quite some time, the evolution of deep learning has indeed succeeded in establishing its empire in the technology market. Now deep learning dominates everyday life, from self-learning online engines to artificial intelligence powered by deep learning involved in almost every field of the human ecosystem one can think of: from bullets to bandages, from the cradle to the grave.

Despite its rapid evolution and its astonishing compatibility, artificial intelligence, it seems, has yet to see a promising future in the food industry. Much of the delay may be attributed to a couple of reasons. First would be the mutual uneasiness of leaving the human activity most substantial for life and well-being in the hands of something not human. While it may seem ironic that people would hesitate to command artificial intelligence to prepare food for them, while endowing upon them the duty of education, manufacturing, and even protection, it is crucial to note that cooking has always been a duty of intimacy: a manual labor of care mostly performed by guardians and close friends. The other reason would be that the food industry has always been one of the slowest industries to adapt to



new technologies. The technology of a food manufacturing institution, let alone that in an individual kitchen, seldom faced changes during the last centuries. This static nature of the food industry was preserved in factories because it got the job done in considerably low costs, and it was preserved in kitchens because most people who cook do not view cooking as a task that serves a single purpose of feeding one's stomach, but a skill that, when polished, may bring unparalleled joy.

Despite the reasonable skepticism toward establishing a healthy, functional synchronization between artificial intelligence and the food industry, the progression of artificial intelligence technology that allows machines to improve the production line and accurately analyze and cater to individual needs are rising as the key improvements that will pioneer the future sphere of the food industry. Such progression in the food market is anticipated to bring substantial change in both factories and sorting lines. For instance, TOMRA, an AI-based food sorting machine that aims to reduce the amount of waste in food sorting. TOMRA uses data of the minimum standard of quality of potatoes, and successfully sorts potatoes into those set for French Fries' production, or those better qualified to crisp or potato wedge products. This new form of sorting allows the utility of almost every crop without discarding the smaller ones. Another intelligent device called the Momentum Machine, can 400 burgers an hour through a 24-square foot machine-powered assembly line. Both mechanisms allow a convention of human labor, while efficiently limiting costs and wastes at the same time. Pieter Willems, technical director at TOMRA Sorting Food, says that "It is about capturing the essence of this consumer thinking and putting that intelligence into a machine...The ability to control a natural variable and apply a degree of intelligence to the process would be hugely powerful tools to the food industry in general" (TOMRA Sorting Solutions, 2015).

The utility of artificial intelligence continues to the markets and the homes. Amazon's unmanned store without lines or checkout counters is already in use in various cities in the US. Customers are tracked with sensors while they shop, and their purchases are automatically sent through the database and charged to the shoppers through their Amazon account. Hello Egg, an AI-powered "home-cooking sidekick" (Cherian, 2017), lets the experience continue in an individual kitchen. This egg-shaped can "plan weekly meals according to dietary preferences, demonstrate cooking tutorials on its convex video screen, supervise the pantry, organize shopping lists, and arrange grocery delivery." (Chowdhury, 2017)The deep learning model that allows computers to simultaneously learn its users' preferences and provide personalized products and advice is becoming the gadget of a breakthrough for technologies that savor the joy of consuming or cooking food while making the experience unique and considerably convenient for customers and manufacturers alike. Researchers anticipate the usage of artificial intelligence to grow significantly in the next couple of decades of progression: perhaps the future in which humans trustfully endow their food-related chores to intelligent machines is slowly but certainly arriving.

## PROPOSAL

This paper proposes one-way artificial intelligence can be applied – image classification. An example of this is a computer algorithm that can categorize beef products according to their qualities. To do so, we utilize the mechanism of CNN, or Convolutional Neural Network. The following is an example of how the model works.



## Figure 1

As shown in the Figure 1, the network consists of four main steps (i.e. convolution, pooling, full connection, and output prediction). How each of these steps works will be explained in the next part. **TECHNOLOGY** 



### What is CNN?

CNN, or formally known as Convolutional Neural Network, is a class of artificial neural networks that is used for analyzing visual imagery. A CNN consists of an input and an output layer, along with multiple hidden layers between them, as seen in Figure 2. (Krizhevsky, A. et. al. 2012)



Figure 2.

#### How a CNN operates

#### I. Image Conversion

All images that are shown to CNN are converted into pixels. Each pixel takes numerical value between 0 and 255, and each of these indicates the intensity of the color as seen in Figure 3 below.



Figure 3.

Above is an illustration of how image is converted into digital form. Unlike black/white images (which take 2d arrays), colored ones take 3d arrays (i.e. red, green, and blue layer). (Krizhevsky, A. et. al. 2012)

#### **II.** Convolution

Simply put, convolution can be understood as the mixing of information. Its purpose is to simplify input images by sorting out particular features.



Figure 4.

We start by taking the feature detector and comparing it with the top left corner of the input image. The calculation is done by multiplying each pixel value in the detector with respect to the values in the grid of same size in the input

image and adding up all the products. These product values make up what is called a feature map, and each of these maps make up a convolutional layer. After that we apply what is called a rectifier function in order to form a ReLU layer. (Krizhevsky, A. et. al. 2012)

### **III.** Pooling & Flattening

Pooling is similar to convolution in that its purpose is to reduce the spatial size of the representation and computational complexity of the network. The most frequent method of this process is called max pooling, as seen in Figure 5.





Pooled Feature Map

Figure 5.

This is done by taking the maximum value in each grid from the feature map (test grid size doesn't matter; in this case a 2\*2 sized test grid was used). (Krizhevsky, A. et. al. 2012)

All pooled feature maps go through the flattening process (Figure 6) where the numbers are taken row by row and put into a single long column. When all pooled feature maps are flattened we finally form an input layer of the convolutional neural network. (Krizhevsky, A. et. al. 2012)



Figure 6.

# **IV. Full Connection**





Figure 7

After the input layer is formed, all the layers are compiled to create a single fully connected network. As the information flows from left to right during the training process, it goes through the hidden layers and at last the neural network comes up with a prediction. Each time a prediction is made an error is calculated and the program adjusts its weights (simply put, a weight indicates the strength of synaptic connection between two neurons) according to the error. This re-adjusting process is called backpropagation. The neural network continues this cycle until it is fully trained. (Goodfellow, et.al. 2016.)

### TECHNOLOGY

Structuring and exercising are two primary steps in cultivating a successful deep learning model. To further fathom the importance of these steps, one must know how exactly the mechanism of deep learning is structured. The neural network, or the structure of the deep learning model, is consisted of the input, the hidden, and the output layer. These three portions determine the successfulness of the due calculation by utilizing a node, or a connection point for data transmission and communication. (Goodfellow, et.al. 2016.)

The input layer's function is to sort the values of inserted data. While doing so, it traffics the information to the adequate nodes in the hidden layer, thus maintaining the equilibrium in the data circuit. The various nodes in the hidden layer receive and work out the data passed on from the input layer utilizing Forward Propagation. During this stage, the network compares the data with the real value to detect any errors. The output layer then concludes the traffic, determining the value of the information processed from the previous layers. (Goodfellow, et.al. 2016.)

To accommodate the needs of the programmer, some elements within a neural network are often revised. For instance, a change in the hidden layer's nodes may be made, to differentiate the activation function, or the input proceeding mechanism. The number of hidden layers may also be altered, for in the case of algorithmic programming, the more is not always the best. (Goodfellow, et.al. 2016.)

The exercising, or training, of a neural network, swiftly follows its structuring procedure. A neural network differs from the conventional computer in a way that it may continually evolve and accustom itself to any data, instead of utilizing static codes that serve singular, unchanging functions. This process includes accumulating the necessary elements that could affect the output, allowing the network to wield effective, comprehensive knowledge of all causes and effects. (Goodfellow, et.al. 2016.)

After a satisfactory accumulation of statistics, the data is divided into test sets and training sets. Of these two portions, the training set is first entered in the deep learning model to establish a predicted result, which is then contrasted with the definite standards. While the data is being processed, the Back-Propagation method is used to calculate the error distribution in the output. After each training sets, or epochs, are completely dealt with by the layers, final examination via the test sets ascertains that the network is complete and reliable.



This paper suggests four main ways in which artificial intelligence can be applied in food industries and furthermore in the field of food science. (Goodfellow, et.al. 2016.)

# I. Pattern Recognition

An example of this is the application named Pic2Recipe developed by researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL). When an image of a food is shown, the application correctly identifies recipes for that particular food 65 percent of the time. This app shows the potential for AI to be used to identify patterns in food production.

The program might not be useful for now due to its relatively low accuracy. But things may be improved in the future, as the system behind the Pic2Recipe app gets more data training. In the future with enough data, the app should reach almost perfect accuracy.

# **II.** Classification

Nowhere is the potential for AI more useful than the potential of AI for classification. Using CNN, we can teach AI programs to:

Firstly, classify beefs into different types, for instance, chuck, rib or loin.

Secondly, classify beefs into different grades, for instance, Prime, Choice, or Select

Lastly, within a grade, such as "Choice," we can further grade the beef to, say, top 10% or top 25%.

The author of this paper is working on developing a program that will be able to do this. If successful, the advantages are:

1. Savings in cost - there will be no requirement to train human classifiers, no need for years of training.

2. Time saving.

3. No human bias, no health insurance, no pensions, or no time off; in other words, there will be no human limitations.

4. Easily available to anyone.

5. Consumers can check on their own if the local butcher is really accurately representing the grades of beef.

## **III. Process Modeling**

A third application of Ai in food sciences is process modeling. The optimization of food processing operations may not be an easy task due to complexities and variations in the raw materials.

Algorithms have proved to be an important tool for difficult search and optimization problems and have received increased interest during the last decade due to the easy way of handling multiple objective problems. Enitan, A.M. and Adeyemo, J. 2011)

Optimization techniques that have been applied to solving complex problems include: linear programming (LP), nonlinear programming (NLP), dynamic programming (DP), stochastic dynamic programming (SPD), genetic algorithm (GA), differential evolution (DE), shuffled complex evolution (SCE), fuzzy logic (FL), simulated annealing (SA), ant colony optimization (ACO), particle swarm optimization (PSO), and artificial neural networks (ANNs). (Enitan, A.M. and Adeyemo, J. 2011)

The process-modeling problem consists of finding a sequence of actions that leads to the desired goal from an initial state. By formulating a process model as a planning problem, we can answer questions such as:

Is the food manufacturing process guaranteed to deliver the required outcome?

Are there other ways of arriving at the same outcome?

Does the manufacturing process contain redundant steps?



#### **IV. Quality Control**

A fourth application of AI in food science is quality control.

A factory is churning out, say, pizzas, when a sensor spots a defect. That data is fed to a computer in the cloud, which immediately pulls the defective pizza from the line and orders a replacement. That's real-time problem solving that can save manufacturers billions in lost resources. (Business Insider, 2017)

## CONCLUSION

This paper therefore concludes that

I. Artificial intelligence will be with us and this is just the beginning of AI in food-related areas.

II. Soon, AI will take roles in all the levels of food production.

III. Practitioners in food industries and food science, whether they be in education, inspection, or production, must become familiar with this new technology and begin to incorporate the advantages of AI into their practices.

After decades of evolution since its genesis, the deep learning technology has stretched its influence upon not only the urban life but also upon the domestic, making it no longer an exaggeration to state that artificial intelligence will soon take over all steps from the fields to the tables. The flexible but precise nature of deep learning allows machines to produce data-based outcomes that satisfy the wants and needs of every individual.

Although artificial intelligence and data-based technologies have yielded successful devices in food sorting and the kitchen, their complete applications in food science yet face concerns, for the outcomes would relate directly to the well-being and thus the life of its clients. The relatively slow pace the food industry has on accepting new technology also plays a role in the skepticism. Of course, is inadequate to argue that digital technologies will take over the kitchen and food circulation in the future; however, it is true that they have been devised to better individuals in carrying out such labor. Through recognizing the advantages that deep learning provides in the food industry, will its users in the future be able to explore its actual possibilities and applications.

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# The Role of Data Mining and Machine Learning in Biotechnology

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## ABSTRACT

The advance of deep learning technology has made many things possible. Despite its relatively short history, deep learning is now getting involved in almost all spheres of the modern society. Of course, the most substantial reason for this ubiquitous adaptation is the structure of deep learning models itself, but the amount of data that is reaped via contemporary data mining must also be credited. Recently, artificial intelligence powered by substantial data mining has begun to take part in the field of biotechnology and medicine. This paper will discuss the advance and issues of using deep learning to solve problems and create change in biotechnology, with particular attention to artificial neural networks and data mining. Furthermore, this article will address the advantages and limitations of utilizing deep learning in medicinal practices and therefore, saving and improving human lives.

## INTRODUCTION

The evolution of humanity's technology had consistently widened mankind's sphere of influence upon its own life and the world around it. As James Brown sang in one of his renowned masterpieces, "Man made the cars to take us over the road / Man made the trains to carry the heavy load / Man made the electro lights to take us out of the dark / Man made the boat for water like Noah made the ark." Through centuries of development and several industrial and technological revolutions, humanity had, if one may say so, has gotten closer and closer to something godly: a nearly omniscient breed that could achieve almost everything within its boundary of imagination. However, humankind has stayed, alas, mortal. The race that has obtained control over nearly everything is still powerless against a strike of misfortune towards its health. While the shackle of mortality will always bind humankind -as it should- the modern technological revolution represented by data mining and machine learning has succeeded in establishing a biotechnological breakthrough that will keep a man, at least, from dying an untimely death.

Deeper research into the technology of deep learning presents the inquirer with an exciting tingle of discovering a vast ocean of possibilities. Machine learning enabled by the contemporary era of infinite information is entirely different from any technology that had come before simply because it's an attempt to make something human-like: not in flesh and bones, but of intelligence. The very conception of the deep learning was rooted in making a machine think like a human being. The very structure of the deep learning model imitates that of the human brain: a pool of representational data, in the form of structured algorithms and self-sustaining codes, piled on top of each other like brain tissues to achieve a single goal: to think, decide, and learn like a human brain. As seen in Figure 1 below, the artificial neural network is modeled after an actual human brain neuron.





#### Figure 1.

(Retrieved from: https://sites.google.com/site/mrstevensonstechclassroom/hl-topics-only/4a-robotics-ai/neural-networks-computational-intelligence)

While the idea of such a technology seems considerably new, it had existed for several decades, since when the celebrated electronic engineer Kunihiko Fukushima introduced neurocognition – a multilayered computational architecture that can define patterns through learning – in 1980. Although Fukushima's invention had staggered due to difficulty in both software and hardware, the turn of the century signaled its resurrection when the AI pioneer Geoffrey Hinton utilized the Boltzmann Machine, or RBM, to reorganize deep learning's neural networks. Since it walked out of the Lazarus Pit of dead technologies, deep learning has been sufficiently rewarded for the past decades of neglection. Of the 10 Breakthrough Technologies of 2017 (MIT Technology Review, 2017) nominated by the MIT Technology Review, four are technologies directly related to machine learning and the utility of the big data. The ability of deep learning models to learn has allowed the technology to influence almost every field in life.

Despite its compatibility, deep learning has seldom collaborated with the world of biotechnology. Perhaps the biggest reason for the phenomena was because most people when they were given a choice, would rather entrust their health to another individual, rather than to a machine. Another reason for the neglection was that data alone could not exert practical influence upon the patient. However, the accumulation of information in the field of health and medicine had become more animated than ever through the help of systematic data mining, and its synchronization with the introductions of increasingly concise hardware is beginning to create a platform for machine learning and biotech.

Researchers at Google succeeded in training artificial intelligence to detect the spread of cancer or other prevalent diseases, such as tuberculosis, through X-rays with an astonishing rate of accuracy. Prototypes of microchips and nano machines that detect hostile fluids or anomaly within the bodily system are rapidly developing under a shower of patronization from tech giants and ambitious corporates. While diagnosis and the treatment of evident diseases are also in the limelight, one of the most prestigious amalgams of deep learning and biotechnology is the technology to monitor one's health and predict a problem. Enabled by large genetic data, information about the patient's lifestyle, and an ocean of precedent cases, such "sensor" technology would be able to create personalized treatment plans and diagnosis for everyone. Dr. Eric Topol, director of the Scripps Translational Science Institute, asserts that "the potential is perhaps the biggest in any type of technology we've ever had in the field of medicine...computing capability can transcend what a human being could ever do in their lifetime" (Tirrell, May 2017).

Of course, the deep learning model in artificial intelligence is not perfectly functional as a human being: the lack of ability to read unstructured information or to identify the cause of the answer over the answer itself, is still a technical difficulty that must be overcome. Also, the fact that most medical data is stored in servers of individual clinics or hospitals rather than revealed to the public is another problem in data mining that becomes the substantial base of machine learning. Moreover, the ethical concern of how far computers are to set foot on a doctor's turf continually arises. While the recent evolution of technology has indeed succeeded in creating valuable secretaries, it still seems that humanity is not wholly ready to leave their well-being entirely upon a computer's hands.

## **BIOTECHNOLOGY APPLICATIONS**

I. Technology of Discovering Infected Cells among Normal Cells.

Singularity Hub reports that machine learning has invaded the field of biotechnology with tremendous success and is currently capable of being utilized in running professional tests (Bethencourt, March 2017). What researchers are most hopefully anticipating is an AI technology that operates in cellular measurements.

Deep learning technology's capacity of differentiating factors based on learned databases will prove to be especially beneficial in brisk but concise diagnosis of abnormal cells or enzymes, especially of conditions and deceases that may be fatal. Such diagnosis and cure methods may be conducted through methods of body scanning including X-



rays, or even by nanotechnology (Figure 1) sufficed with machine learning. More establishment of deep learning in the field of biotechnology may yield the technology of discovering and curing the human body in a scale that was once deemed impossible.

II. Implementations in Bioinformatics.



# Figure 2.

(Retrieved from: http://www.divyahimachal.com/2011/09/expanding-opportunities-in-bioinformatics/) Bioinfomatics is the blending of mathematics, biology, computer programing and data to create actionable information in prediction models and application models, as seen in figure 2 above.

It is plausible that in the future that the evolution of data mining technologies will result in broader, more detailed databases, even of comparably covert medical information. Deep learning may be a key technology that recognize medical patterns and healthcare situations in different regions and communities, thus diagnosing factors such as the spread of epidemics, and distribution of healthcare programs. Such applications will prove to be especially fruitful if utilized by organizations that act as benefactors, such as the UNISEF, or governments to research the enforcement and effectiveness of health cares.

# DEEP LEARNING MODELS

As mentioned, the artificial intelligence technology primarily focuses on creating a computer model that, in structure and function, parallels the human brain. The brain is an amalgam of intertwined, communicating neurons. Like so, the basic building blocks of the deep learning system are the nodes, or processors that recognize, traffic, and evaluate the value of stimuli; or in this case, the input data.



## Figure 1.

(Retrieved from http://www.kdnuggets.com/2017/08/deep-learning-neural-networks-primer-basic-concepts-beginners.html)

Nodes in a deep learning model are usually divided functionally into three different types of layers: the input, the hidden, and the output layers. (Figure 1) These tissues' functions are mostly loyal to their names. The input layer accepts the incoming data and encodes it while weighing the fundamental value of the information. The one or more hidden layer genuinely determines the data's value and establishes/reinforces theoretical insight toward data. One of the most primary functions of the hidden layer is to produce procedures called back propagation, through which the network calculates the value of the input information and then adjusts the weights in the program according to the actual calculated outcome. Finally, the output layer computes the errors and finalizes the steps.

Of course, a neural network undergoing deep learning must experience multiple pieces of training and tests to become complete. During these difficult procedures, the existence of a vast, reliable database is doubtlessly necessary. Accordingly, a deep learning process usually requires a team of researchers, who train the network by data harvested by data mining. Data mining is, simply put, a process of discovering demographic patterns -that would most likely be impossible through manual procedures- in huge volumes of data. Patterns are harvested through a broad range of techniques, usually divided the kind of information. Some of the most well-known techniques are predictive modeling and descriptive modeling, in which the data is tested by an existing training data or clustered in groups. Data mining is an evolving technology that used in almost every sphere of life, including not only computer science but also politics, education, and media entertainment. In the modern world where information is the prime value in life, data mining is often deemed as the criterion of power.

### IMPLICATION FOR EDUCATION AND TEACHERS

While it is true that AI in its current stage of evolution is not yet adequate to serve the role of a tutor, this fact does not mean that artificial intelligence will never be able to take the mantle of a teacher in the future. The current difficulties in machine learning must not hinder researchers from further enhancing the future role of adaptive technology such as adaptive learning software and learning management systems in the future classrooms and curriculums. It is crucial that we recall the difference artificial intelligence will make in how and what we learn, and start to devise new methods of implementing this technology and further enhancing our policies and knowledge of it.

#### ROLE OF TEACHERS

As the role of AI systems increases in education, teachers will need to develop new skills

- According to the creators of the AIEd system (Luckin, R.et.al. 2016) teachers will specifically need:
- 1. the capability to utilize AI products along with their curriculum;
- 2. an ability to develop research skills regarding AI and be able to interpret data
- 3. an ability to utilize AI data and incorporate them into the curriculum
- 4. an ability to manage AI resources effectively. (Luckin, R.et.al. 2016)

# CONCLUSIONS

As astonishing as the deep learning mechanism is, a complete artificial intelligence may never be created without a substantial database of harnessed information. It is not an overstatement to assert that artificial intelligence's wide variety of uses and compatibility should be primarily credited to the recent evolution of the data mining technology. However, creating a successful, updated database is especially challenging when it comes to harvesting data relating to biotechnology, due to reasons such as the exceedingly animated nature of the biotechnological field and limited medical data revealed to the public. However, this difficulty may have met a breakthrough point recently, as corporates and some major medical alliances are showing a willingness to participate in establishing a common ground of data and research for the development of biotechnology. Without a doubt, it is viewed by scientists and researchers that such projects will primarily revolve around deep learning and artificial intelligence.



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# The Role of Data Mining and Machine Learning in International Relations

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### ABSTRACT

Amongst various fields that data mining technology has been applied to, the sphere of international relations is perhaps the one amongst most controversy. Mainly, the issue of data mining and data-reinforced artificial intelligence technology in global power distribution has been addressed multiple times in recent years, from the US assassination of foreign enemies to Edward Snowden's reveal of national surveillance in the United States. This paper discusses the mechanics and influence of data mining, with a special focus on the increasing influence it has on the international distribution of power. Furthermore, this article will show major concerns towards issues that may be proven legitimate via the contemporary progression of digital data related technologies.

#### **INTRODUCTION**

On May 2, 2011, a team of United States Navy SEALs attacked a compound in Abbottabad, Pakistan. This famous military action, code-named Operation Neptune Spear, led by the CIA and monitored directly by former president Barrack Obama, was aimed to capture and eradicate one of the most notorious "enemy of the state" Osama Bin Laden. An autonomous Sentinel drone narrated the operation, as officials, including Obama, nervously monitored the raid. Due to the painstakingly discrete nature of the process, no major firefight took place. A few hours after the SEALs entered the compound residents, Bin Laden was killed in action, and the decade of searching for one of the most nefarious terrorists in the US history came to an end with the confirmation of Bin Laden's death.

While the operation itself took only a few hours, it is crucial to note that the data gathering and monitoring process that took place through months beforehand was just as arduous and in high stakes. The search for America's most wanted began with a piece of unearthed information leaked in 2002, after which followed a decade of data gathering. Germany's Federal Intelligence Service -BND- and the United States' CIA collaborated to locate the exact whereabouts of Bin Laden, continuously sharing valid information. Months of wiretapping, data mining, and analyzing movements within the compound area after information was narrowed down specifically. Although the compound itself had no Internet or a landline telephone service, the role of acquiring digital data still played a crucial role in establishing a firm base of reliable information required for a military inrush. Therefore, it is legitimate to state that the operation that eliminated one of the middle east's most influential terrorist was substantialized by persistent and painstaking data mining.

When the assassination of Bin Laden and Operation Neptune's Spear went viral, so did the ability of United States government and intelligence services to utilize international data mining and surveillance to get whatever information that they required. However, as obvious as this fact was, it was not nationally and critically brought up until Edward Snowden, former US intelligence contractor, disclosed to the public the "secret, massive and indiscriminate" (Bowcott, December 2014) surveillance conducted by the government in the name of fight against national and international threats. Snowden revealed to the world the existence of PRISM, a program which the United States National Security Agency may utilize to collect internet communications and concurrent information from at least nine major US internet corporations. His disclosures also revealed several global surveillance programs that included the participation of telecommunication companies and European governments. While the American public knew vaguely already what the US government was capable of when it came to the acquisition of data, the fact that the government was utilizing its ability to accumulate information of its citizens came as a sensational shock nonetheless

Snowden's disclosure also disturbed citizens and governments of several other nations, for it was evident that the United States' net of data had no boundaries. In his report on the matter, Nils Muiznieks, commissioner for human rights at the Council of Europe, wrote: "It is becoming increasingly clear that secret, massive and indiscriminate surveillance programs are not in conformity with European human rights law and cannot be justified by the fight against terrorism or other important threats to national security. Such interferences can only be accepted if they are strictly necessary and proportionate to a legitimate aim". He also added that "surveillance has gone beyond the bounds of the rule of law and democratic oversight needs to be more robust."

Data mining is the practice of statistical harvesting patterns from such enormous databases while focusing on the extractions of models that may prove to be beneficial. The current progression of the internet had brought life upon the era of information via digital communication. The animation of data worldwide resembles communicative hormones between ants and the dances of bees that signal the whereabouts of honey. Especially on platforms such as major search sites and SNS pages -it was on Twitter where Snowden publicized his exposures-, unlimited data regardless of almost any boundary circulates the database every second of every minute. For nearly every action upon the internet is a deliberate and traceable emitting of data, it would be correct to conclude that who owns the big data and has the technology to "mine" necessary pieces in this vast ocean of information would own the upper hand on almost every corner of life: and as the cases of two "America's most wanted" -for Snowden must be just as much as a terrorist and a wanted man to the US government as Bin Laden had been- has proved, upper hand on international matters as well.

Data mining and its applied form -machine learning in artificial intelligence, since its utility in the modern times, have had considerable influence on politics and international relations. The 2012 election campaign of former US president Barrack Obama utilized data mining to analyze voter behavior, and companies such as Google and Amazon employ predictive analytics via intelligent computers to establish a personal profile of every user worldwide that allow them to predict and recommend required products. Researchers in Spain developed a model using data records to create maps that monitor and predict the distribution of wealth in Europe with high accuracy. Effective data mining and machine learning have now indeed become a power in the modern world. This present "black magic" grants its users with a wholly new dimension of power truly without limit. As the examples discussed reveal, contemporary wielders of this technology easily own an upper hand in politics and society, international issues, from developing databases of global trends and individuals to developing an arsenal of intelligent machines -US military has already succeeded in developing drones that is empowered by a deep-learned face recognition software able to detect specific individuals even in crowds. Andrej Zwitter from the Carnegie Council on Ethics and International Affairs asserts that big data "changes power distributions and thereby some basic assumptions of international relations theory, and its analytics will increasingly inform international relations and policymaking. It has created both new opportunities and threats in areas such as humanitarian aid, development, and international peace and security" (Zwitter, December 2015).

The technology of data mining had benefited the digital human life and powerfully influenced international issues in the last couple of decades. However, like any technology, it is a double-edged sword. Even with only the humblest understanding of the human nature, it would be deception to assert that such power would only fall in the right hands, for even without referring to works of George Orwell and Kurt Vonnegut, we have learned through the history of nations -and the history of technology- that absolute power corrupts absolutely.

## APPLICATION FOR INTERNATIONAL RELATIONS

The seas and the air belong to no nation, yet belongs to every nation. Sure, there are boundaries on the world map that determine naval and national precincts. However, since the movements of waters and air abide by the rules of nature and not international laws, it could be said that they belong to and depend upon the good judgement of all humankind. Sadly, this responsibility has not been taken in the last decades, for researchers announce that international pollution and rates of global warming have skyrocketed during the last century (Figure 1 and Figure 2).





Figure 1. (Retrieved from https://www.eea.europa.eu/soer-2015/global/pollution)



## Figure 2.

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(Retrieved from https://www.washingtonpost.com/news/wonk/wp/2013/07/09/you-cant-deny-global-warming-after-seeing-this-graph/?utm\_term=.a25da7af9c37)

One of the outstanding reasons for this phenomenon is the lack of international monitoring over which nation must take more responsibility than others in emitting energy wastes and polluting. Data mining technology's ability to detect water and air movement patterns along with the regional rate of pollution will allow to discover which nations must take especial cautions in utilizing the gifts of nature. Consequently, it can be hoped that this application will lead to more participation in maintaining global property and furthermore environmental health.



### THE STUDY

Data mining is a process of turning raw data into beneficial information. Usually a procedure of discovering patterns in large databases, data mining holds unparalleled influence in the contemporary society, in which almost everything is relatable to data.



Figure 3.

(Retrieved from http://www.zentut.com/data-mining/what-is-data-mining/)

Data mining process can be broken down into several major steps. First, data is collected by organizations and encoded into data warehouses, or private databases. Then, researchers store and organize data according to use. The stored data is sorted and searched for correlations and patterns, usually by an application software. Deep learned artificial intelligence might play a significant role in this procedure, due to its outstanding ability to recognize patterns and sort input information. Finally, the end user presents the mined data and trends in a convenient format, usually a graph or a table (Figure 3).

The power of data mining technology parallels the availability of data in the community, for data is drawn from different platforms including cell phones, surveys, social media, internet searches, and so on. The contemporary boom of information on the web abled the research and collection of almost infinite amounts of data and resulted in the birth of fin-tech -an amalgam of finance and technologies- companies that innovate and enhance traditional products and services to gain profit. A recent discovery has shown that data mining technology is one of the most influential technologies in the modern world, and is even employed in fields such as politics, education, biotechnology, and international relationships.

#### IMPLICATION FOR EDUCATION AND TEACHERS

While the evolution and application of AI in multiple fields have been notable in the past decades, there still exists major criticism upon its future role as a teacher or a tutor. While it is true that artificial intelligence and data mining is yet to endure technical and moral lashes, it is an absolute folly to deem these technologies unfit for roles in the classrooms.

This paper had addressed the structure and possibilities of data mining and machine learning. Also, by providing examples of their applications, it had addressed that through beliefs and time, technologies have changed not only the way we work but also the way we learn and live. Educators must note that further evolution of these technologies in the future will indeed make significant changes, and prepare by devising new curriculums, recreating policies, and implementing innovative digital systems.



#### CONCLUSIONS

Snowden's disclosure of the capability of US surveillance made the public recognize what has been overlooked by Operation Neptune Spear: that the technologies that exerted power overseas may be, and are, used upon populations in the nation. Particularly in countries with higher technological power, such capacities are indeed incredible. Undoubtedly, the technologies relating to data is of unparalleled influence in the global society. As the broad applications and impact of deep learning are recognized, international voices towards regulating big data constantly rise. However, for the degree of data mining utility in the international community is, by nature, often vague and unable to censor, researchers, agree that such voices will only get louder in the future.

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# The Role of Data Mining in Political Science and International Relations

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## ABSTRACT

The controversial question of the use of data mining in the election process has been widely debated in the political science arena, with Micro-targeting emerging in 2004, Big Data taking more influence in the 2008 United States presidential election, and data-driven campaigning becoming the norm in 2012. Gaining the upper hand on mass quantity and quality of information is the key to political power in the 21<sup>st</sup> century. This paper addresses the definition of data mining and its use to influence the electorate population. Furthermore, this article will focus on the incredible prestige data mining technology holds for politicians in the future, and resulting concerns. Specifically, in my project, this paper be looking at the use of artificial intelligence and machine learning to drive the next generation elections. This paper discusses the future role of artificial intelligence in teaching political science and International Relations, and juxtapose them against traditional methods of political science and International Relations, in order to reveal the increasing role that A.I. will play in the 21st century classroom. I argue that, indeed, artificial intelligence will be able to increasingly affect future elections and that this development will profoundly change the way politics is taught in the classroom. In conclusion, this project, by closely examining the role of machine learning in data mining of elections, sheds new light on the rapidly developing changes in political science and International Relations.

### **INTRODUCTION**

Technological revolutions in the past have signaled the birth of inventions that were dominantly visible. Growth in the twentieth century was highlighted with factories, urbanization, and computer hardware. Practicability and innovation were the forthright virtue. But as the century turned, so did the pages of technological prestige. Now it's all about data: the era of information has begun, and its influence in just the past decade had been breathtaking.

The movement of the vast amount of information that passes through the databases every day somewhat resembles a scene from "The Matrix" in which every object and being are depicted as an animated flow of data. As ants and bees signal each other through specific codes and movements, humans continuously emit data. From a purchase in a drugstore to a private search on Google, almost every activity equals a piece of information: the communicative hormone of the modern human ecosystem. The salience is that a piece of information, no matter how small, is seldom discarded. On July 2017, Facebook updated a list of statistics about its users worldwide, claiming that "1.28 billion people log onto Facebook as daily active users" and that "on average, the Like and Share buttons are viewed across almost 10 million websites daily" (Zephoria Digital Marketing, July 2017). Despite that every action of an individual now circulates the global database in the form of 0s and 1s, there is not many who take it seriously, either due to pure indifference or a mutual reassurance that such information will not be taken advantage of. While it is true that no corporate marketers or politician are interested in someone liking a video of a singing cat, it is excessively naïve to assure that personal information and inclination exposed on the internet is passed unnoticed.

Data mining is the practice of harvesting beneficial statistical patterns from an enormous pool of data and forming it into a certain structure for further use. While also called "knowledge-discovery in databases," the term data mining itself is quite self-explanatory. However, the term "mining" may be misleading, for data mining focuses on the extraction of patterns and knowledge rather than the extraction itself. Data mining was first developed as a method to furnish marketing strategies further. For this function, programmers focused mainly on structured data, which had a fixed formality of researchable topics. However, soon the data mining method became sophisticated enough to tackle unstructured data: for instance, searches on web engines, photo data, and history of purchases. The ability to see through patterns and correlations, classify vast amounts of information, and cluster similar-structured data allows data mining to serve as a substantial foundation for artificial intelligence and machine learning. Consequently, artificial intelligence powered by data mining is capable of diagnosis, classification of trends and forecast of problems.



Data mining is a critical power in almost every sphere of modern life, but the field it exerts the most influence -and thus is most fiercely debated on- is undoubtedly politics. From 2008, United States' political campaigns have utilized microtargeting – reaching out to individual voters with explicit appeals based on their demographics. The Obama campaign in 2012 also greatly benefited from its substantial pool of big data and its utility. CBC News' Senior Correspondent Susan Ormiston vividly reports the astonishing force that data mining has in the hands of political parties. "It's a candidate's chance to press the flesh, of course, but increasingly, it is the entry point for data mining, which is how parties collect as much data as they can about you and your voting intentions. Whether canvassers enter it into an iPad or scribble it in a notebook, the information you inadvertently give a prospective politician will end up in large databases jealously guarded by each of the parties – and closed to the prying eyes of privacy commissioners." (Ormiston, 2015).

The fact that an all-seeing programmatic harvester of information -with artificial intelligence- is aiding political campaigns unsurprisingly comes as disturbing to most. Susan Ormiston's interview with Jill Mills, a voter in Ontario, represents a worldwide concern towards data mining in political science. "I think we have a Big Brother watching us," she reports. "You know it's kind of scary, in a way, because what are they going to do with all this information in the future?" While parties reassure the voters that big data is more about learning what the voters are talking about rather than creating secret files, the omnipresent nature of the great data-enforced artificial intelligence makes it nearly impossible to eradicate the fear of government spying or using the collected information for something more dangerous than mere investigation. After all, George Orwell and the history alike had shown that Big Brothers had existed: that absolute power corrupts absolutely.

The same characteristic of data mining and applied artificial intelligence -and its users- also cause uneasiness in the field of international relations. This present "black magic" allows nations more advanced in the technology a crushing advantage over others, from establishing a functional database of international issues and central figures to developing an arsenal of intelligent machines and manipulating the balance of global power. Andrej Zwitter from the Carnegie Council on Ethics and International Affairs asserts that big data "changes power distributions and thereby some basic assumptions of international relations theory, and its analytics will increasingly inform international relations and policymaking. It has created both new opportunities and threats in areas such as humanitarian aid, development, and international peace and security" (Zwitter, 2015).

Information is one of the most substantial powerplants of the 21<sup>st</sup> century. Thus, data mining, the technological ability to harvest and analyze them, is a powerful tool indeed. However, it is also a double-edged sword. On one aspect data mining is a capable secretary, but on the other, it's the most powerful weapon in the world. The consensus of utilizing data mining and artificial intelligence is undoubtedly valid: whether it is a progression or regression for humankind conclusively is a question that its employers must contemplate on.

#### POSSIBLE APPLICATIONS IN POLITICS

Face Recognition in Political Microtargeting

Since the early 2000s, politicians have vigorously utilized data mining and artificial intelligence programs to target possible voters. Until recently, such "microtargeting" was based mainly on private online searches, amount and content of consumed goods, and regions. However, researchers assert that artificial intelligence will now be able to deduce much more information from individuals, for algorithms may now be able to identify people's political views, traits, and even sexual orientation via photos. While this may sound incredulous to some, Professor Michal Kosinski from the Stanford University asserts that "faces contain a significant amount of information, and using large datasets of photos, sophisticated computer programs can uncover trends and learn how to distinguish key traits with a high rate of accuracy" (Levin, 2017). This could mean that in the future, significantly more personal data will be collected and utilized for political analysis and campaigns.

Smart phones now use face recognition as the method for unlocking the phone instead of a password. The face recognition data collected from this method can be collected and used to create a personal profile for each individual user. Using the large datasets, campaigners can target their political messages to groups, for example, who would be most likely influenced by a certain message.



## THE STUDY: DATA MINING

Data mining is a method of analyzing vast data sets to discover patterns and establish relationships that may be utilized in solving problems and predicting trends. As the forms and frequencies databases may vary, various methods via parameters may be employed. Parameters used in successful data mining include association rules, Sequence or Path Analysis, classification, clustering, and forecasting. Each parameter is used according to different goals in mining information.



#### Figure 1

(Retrieved from https://www.slideshare.net/pierluca.lanzi/machine-learning-and-data-mining-10-introduction-to-classification)



## Figure 2.

(Retrieved from http://userwww.sfsu.edu/art511\_h/acmaster/Project1/project1.html)

For instance, Sequence or Path Analysis parameters search for patterns where one factor leads to another, while a classification parameter (Figure 1) looks for new patterns and predicts variables according to other details from the database. Clustering parameters (Figure 2) group a set of factors, usually previously unknown, based on their similarity to each other.



Data mining was first utilized in fields such as mathematics, genetics, and marketing. The field of economics and commercialization primarily benefited from successful data mining, for gaining the upper hand on data allowed to predict customer behavior and topple competitors using predictive analysis. Later, as methods of mining data evolved, the technology began to adapt to almost every sphere of life. Especially in the field of politics, the ability to uncover hidden patterns and correlations in data meant that the candidates could more efficiently determine what the public wanted, and how to carry out a successful campaign. Accordingly, data mining began to take part in elections and policy making from the early 2000s and has become a crucial factor in the distribution of political power.

#### **IMPLICATION FOR EDUCATION**

Despite AI's wide range of applications, the argument that artificial intelligence is unfit to teach or tutor, unfortunately, still stands. However, this must not necessarily mean that the endeavors to apply artificial intelligence in education of national and international politics must cease. If anything, further modification of knowledge, policies, and curriculums must be put more fiercely into action, as this paper had illuminated the incredible capabilities of data mining and deep learning technology. It is crucial for educators to understand that the future application of AI in the future will change the very concept and methods of teaching, and necessary changes must be made to accommodate further adaptations in the future.

As AI systems and data mining becomes more prevalent, they will begin to influence how political science is taught in schools. While teachers will be not required to know all of the technical aspects of artificial intelligence technology, educators must be familiar with the issues and concerns of how AI systems will continue to influence the political arena. Therefore, educators and administrators at educational institutions must begin to acquire new skills.

#### ROLE OF TEACHERS



#### Figure 3

As the role of AI systems increases in education, teachers will need to develop new skills

According to the creators of the AIEd system illustrated in Figure 3 above (Luckin, R.et.al. 2016) teachers will specifically need:

1. To reexamine the pedagogical models in which political science is taught, given the increasing role of AI systems, particularly the utilization of data

2. To develop and be able to interpret data and use that data to help learners obtain information more efficiently.

3. An ability to adopt to the changing domain model as AI systems become the norm in the political area.

4. An ability to manage AI resources effectively. (Luckin, R.et.al. 2016)

#### CONCLUSIONS

With its implications in the past decade of elections, data mining technology has proven that the ubiquitous flow of data does mean something, and that through the right methods one may harvest enough to bring changes in the voting population. Successful data mining may result not only in accumulating targeted information about the voters but also in attacking the opposite party and establishing policies. The victories and defeats of most recent electoral battles in numerous nations have revolved around data, and it is evident that the technology of mining and utilizing data has become, as some have called it, 'black magic.'

With the rapid development and applications of this prestigious technology comes the users' duty to take responsibility in wielding it. In the contemporary society in which information is the prime power source, it is crucial to understand both its beneficial and detrimental influence, and develop moral guidelines in mining and utilizing data mining. Especially, those who partake in politics in a democratic nation must contemplate on whether powerful data mining will signify a progression or regression of liberty.

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# The Role of Deep Learning in Mechanical Engineering

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## ABSTRACT

The deep learning technology itself consists of both computer programming and mechanical engineering. Perhaps because of this reason, the question of the role of deep learning models in the mechanical engineering field has not been widely explored, with them usually revolving around the use of face recognition, speech recognition, and processing patterns to solve problems. This paper addresses the methodology of using deep learning to solve complicated mechanical engineering problems with emphasis on the use of Convolutional Neural Networks. Primarily, this article will portray the changes deep learning is making and will make in the field of mechanical engineering, with a particular focus on why the deep learning technology is of significance not only in computer programming but also in engineering.

## **INTRODUCTION**

As much as Google Deepmind's artificial intelligence system AlphaGo is now widely and very well known as a milestone of the modern artificial intelligence technology that even talking about it has become something of a cliché. The legendary match between AlphaGo and South Korea's Go champion Lee Se-dol had ended with the prestigious artificial intelligence yielding but a single win to the best Go player in the world. Sure, there has been cases in which artificial intelligence-based models had won against human beings -just a short game of online chess or blackjack against the computer reminds us of our humble intelligence- but what made AlphaGo's victory so much of a legacy and a shock at the same time is that Go is not only a game of precise calculation that could be infinitely reinforced by the data input. Go is rather all about intuition and feel: detecting a hunch, if you will, of what strategy the other player will adopt, and thinking several steps ahead of him. This is a feat that cannot be achieved without some sense of independence. AlphaGo's victory signified a revolution of artificial intelligence, signaling that deeply learned computers now not only wielded intellect but also could imitate intellectual autonomy: a virtue that only humankind enjoyed; a virtue that had made it unique.

The era of information had shortly signaled the rapid evolution of artificial intelligence. Considering that deep learning in artificial intelligence is no more than piling multiple layers of representational data and algorithms from a vast ocean of data, it is but a natural occurrence that the increased circulation and accumulation of data had significantly increased and sophisticated the level of artificial intelligence. Deep learning's recent progression in the Convolutional Neural Network now allows artificial intelligence to process continual flows of information and emit optimal results with a very slim rate of failure. What's more, it is now also capable of determining the problems itself before solving them. The primary reason that had made such a progression possible lies in the structure of deep learning: it is a mathematical model formed after the human brain.

The evolution of deep learning and AI toward a "human-like" intelligence is significant for one ultimate cause: to better human life by receiving aid from the computer. Several applications have already been set in motion: face and speech recognition, mathematical calculations, and even prototypes of self-driving cars. However, the introduction of artificial intelligence in the field of mechanical engineering signifies something wholly another level. While the role of artificial intelligence and deep learning has not been explicitly explored in this certain area, Lauren Jane Heller's Betakit interview with Vention, a 3D mechanical design company, illuminates how the mechanical engineering industry is slowly but steadily beginning to adopt the aid of AI. Vention's CTO Max Windisch announces that "With the help of artificial intelligence, we are paving the way for a significant democratization of mechanical engineering" (Lauren Jane Heller, 2017). The company's custom software is based on AI, that calculates



the mechanical durability and legitimacy of the customer's design. Its deep learning based database allows the final product to be cheaper, more precise, and more conveniently created than when produced by any other method. Venture's CEO assets that their company's AI structure "will allow us to provide powerful classification and search capabilities for patterns recognized in the assemblies that our users produce."

Cloud robotics and automation is another key attempt to synchronize artificial intelligence and mechanical engineering. Cloud robotics in automation is a paradigm which allows various hardware to connect and share data and code within a web infrastructure of information. Thus, it overcomes the limited capability of an autonomous robot by enabling it to act upon an active, almost infinite database that guides the robotics' actions based on artificial intelligence embarked on both sides. The autonomous car that Google introduced in 2017 is already briskly utilizing cloud robotics to index maps, determining the spatial localization and making its own decisions. USA Today anticipates that "A range of automotive and technology have said they aim to produce self-driving cars for ride-hailing programs by around 2020" (Marco Dell Cava, 2017).

The rapid growth of artificial intelligence has indeed penetrated deeply into all aspects. The autonomy of AI followed its intellect, and now it is evident that computers are not only intelligent secretaries but also self-driven and programmatically determined. While this notion comes as uneasiness for the majority -for it indicates a threat to humankind's significance as the most intelligent and autonomous species- developers of artificial intelligence and pioneers of its application anticipate making use of deep learning and artificial intelligence function in a comprehensive fashion, influencing many subjects.

## THE TECHNOLOGY

## I. Convolutional Neural Network (CNN)

Image Classification uses a particular type of deep neural network, called a convolutional neural network (CNN). CNNs are particularly useful for categorizing distinct images and sorting them. (Krizhevsky, et.al. 2012) Using CNNs becomes particularly advantageous when faced with a task of processing a multitude of images.

Convolutional neural network is a multi-layer network that identifies visual features by processing pixels images. CNNs are operated by mainly 5 steps: convolutional operation, ReLu layer, pooling, flattening, and full connection. (Figure 1)



Figure 1.

Neural networks consider images as a two-dimensional array; computer-wise, each pixel range from 0 to 255. A totally black pixel has the value 0 while a totally white pixel has the value 255. The computer recognizes images as a digital form by processing it with 0s and 1s. Red, green, blue layers or RGB layers are needed for colored images. II. Steps of CNN

# 1. Convolution

Convolution, in intuitive terms, is a process when a feature detector — also called as kernel, or filter — is placed on an input image. The sum of values multiplied creates a feature map, or an activation map. Feature map reduces the size of an image, which makes it easier to process faster information. Feature map may lose information; however, the purpose of applying feature detectors is to detect only certain feature that are important. Features shows how it is



easily perceived as. What feature maps do is to preserve important features and get rid of unnecessary things. Multiple feature maps are created because different filters are used. Convolution is therefore a process that detects important features and preserves spatial relationships between pixels.

2. ReLU layer

ReLU layer stands for rectifier layer units. This is a process when rectifier is applied after convolutional layers are built. This increases nonlinearity in images.

3. Max Pooling

Max pooling is used to make neural networks recognize images that are not the same. It enables neural networks to look for exactly the same feature. This requires neural networks to have spatial invariance, a certain flexibility to find features whether they are tilted, distorted, or different in texture. A box of pixels is placed on a feature map. Max pooling then considers the maximum values and disregards other values. This preserves features, gets rid of unnecessary information, reduces the number of parameters, therefore preventing overfitting.

4. Flattening

This process flattens the layers into a column, then inputs this into artificial neural network.

5. Full Connection

This adds a whole artificial neural network to convolutional neural network. A fully connected layer is a hidden layer but it is more specific in that it is fully connected. This combines features into more attributes. (Krizhevsky et al., 2012)

6. Connection to Deep Learning Model

Deep learning is successfully creating a multilayered neural network that carries out similar functions as the human brain. As the brain is made up of neural tissues, an artificial neural network consists of layers of algorithm-driven nodes or multiprocessor particles. The nodes are usually connected to form multiple layers, divided into the input, the hidden, and the output layers. In these intertwined layers, the nodes act like cells in the human brain, passing, processing, and evaluating the value of various stimulus, or in this case, data. (Goodfellow, 2016.)





Before it can be put into practical action, a neural network must go through multiple training and testing procedures to ensure accuracy in problem-solving and pattern recognition. One of the most crucial concepts that must be carried out in the training process is back propagation, or a network's function in which it guesses the output of the raw input, and adjusts the weights in the network according to the actual production. Through several backpropagations, the system gains both accuracy and a profound ability to compare data and their informational values.

A complete deep learning model (Figure 2 above) differs significantly from the conventional computer model in a way that it is precisely monitored to utilize abstract knowledge. This characteristic allows the neural network to establish a sort of comprehensive understanding of the inputs through the continuous stimulus, a method similar with that used by the human brain to learn. (Goodfellow, 2016.)

Of course, the allegory of the human brain is yet just a figure of speech, for the deep learning model yet lacks the necessary intuition, and dynamic thinking paralleled to that of a human. However, it is also true that deep learning and artificial intelligence is one of the most swiftly evolving technologies in the history of the technology itself. In fact, judging from the breathtaking speed of its progress and adaption over the last few decades, it is not a ludicrous

assumption that deep learning will soon be able to duplicate, and perhaps exceed human intelligence.

III. Solutions for Mechanical Engineering Problems

As machines play an integral role in embodying blueprints, keeping good maintenance of machines is a crucial process of mechanical engineering. Therefore, convolutional neural networks can be potentially used to diagnose any problems occurring due to machines.

1. Identifying Damaged Tools

Damaged tools can bring about unexpected events. CNNs can provide a consistent checkout for these tools if they are externally out of shape. The neural network will be provided with images of normal shapes of each tool, trained to recognize them as what mechanics are to use, and the neural network will be used to determine if a particular tool is out of use. This will enable mechanics to eliminate the possibility of using a worn tool and reduce the amount of work they spend to sort out damaged tools. (Figure 3)





# 2. Detecting unusual movements

There can be many reasons for why machines malfunction. For any rotating machines malfunctioning, its axis may be out of place. The axis' center may not be in a correct position or the axis itself may be out of shape. This could lead to overheating of bearing or unusual movement of pumps. Convolutional neural networks are apt to detect these internal problems because moving machines produce vibrations that are observed through graphs as seen in Figure 4 below. (Olivier, 2016)



## Figure 4.

(Retrieved from: Olivier Janssensa, et al, "Convolutional Neural Network Based Fault Detection for Rotating Machinery" Journal of Sound and Vibration Volume 377)

How CNNs could be potentially used is by detecting unusual patterns of graphs of vibrations. Unusual peaks, amplitudes, patterns indicate certain deviation from how the machine should originally work. What CNNs will do is to train itself with data of different categories sorted by level of deviation from standard. As machine operates, a system trained through CNN suited to sort by images will recognize different level of malfunctioning. Mechanics



can further utilize this neural network by training it to provide appropriate diagnosis of each levels. This will provide a relatively accurate detection for mechanical trouble.

### **ROLE OF TEACHERS**

As the role of CNNs and Deep Learning networks and other AI systems increases in usage, mechanical engineering education will change along with it.

According to the creators of the AIEd system, (Luckin, R.et.al. 2016) teachers will specifically need to make value judgments and evaluations when it comes to which AI systems and products should be incorporated into the teaching curriculum, to develop research expertise in relations to AI systems, to interpret data from AI systems and explain such data to learners, to utilize AI assistants in addition to their human counterparts, and to manage AI resources effectively. (Luckin, R.et.al. 2016)

#### CONCLUSIONS

Ever since the existence of mechanical engineering in the civic life, machines have been in charge of creating other machines. Throughout decades of development, conveyor belts and exact machines with a certain amount of flexibility have been introduced to lessen the harsh work of humans. Even so, the synchronization of mechanical engineering and artificial intelligence came as a surprise, if not a disturbance, to most. Perhaps the fact that machines are now assuming full, not partial control, over technological life is the prime culprit of such uneasiness.

On the other hand, researchers assure that deep learning will always put first the safety and well-being of humans. While this is true, it must also be noted that although machines are yet to be independently determined, they are programmatically so. The amalgam of artificial intelligence and mechanics include not only self-driving cars or autonomous 3D printers but also face-scanning, lethal drones and a global surveillance program. Perhaps the primary concern upon utilizing artificial intelligence should be about human morals and values, more than it is about a machines' technical abilities.

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# The Teaching of Anions and Cations with the Educational Set of Ions

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# ABSTRACT

Educational set of ions (ESI) is a card game that can be played with a group of 4. The reason why this game is designed is teaching names and formulas of anions and cations that would form a basis to write and term chemical formulas of the compounds which it is one of the most important subjects of chemistry. This game is prepared for students who study in different grades of education considering the subject on chemical compounds involving anion and cation teaching within the scope of chemistry lesson at high school and university. The game is discusses in 3 steps and these are "contents of the game set, playing the game and rules, and evaluation of the game results". Pilot scheme conducted in development step of the game was performed with 49 students in total who studied in Science Teaching, Chemical Engineering, Food Engineering, Pharmacy and took lesson of General Chemistry. As a result of the pilot scheme, ESI was put into final form by making arrangements as regards decreasing amount of students in the group, having students sitting in a round, designing answer sheets as reusable in press printed to prevent paper wastage and playing the game by gathering the cards couldn't be written by students.

Keywords: ion, anion, cation, chemical formula, training set, card game

#### **INTRODUCTION**

Compounds forming a basis in chemistry subjects can be shown as one of the subjects which students have difficulty in understanding (Demircioğlu and Demircioğlu, 2005). In the studies conducted, it is thus emphasized on the difficulties encountered in learning the subject on "terming chemical compounds". Besides, it is intended to teach the subject by using learning methods based on the game (Turaçoğlu, 2009). Chemical element and compound terming, periodic tendencies, ionic loads and electron configurations and etc. are suggested as some subjects to discuss through the game (Howe, Krone, Reiter & Verby, 2005).

Periodic table including classification and properties of elements has a quite important place in learning basic concepts of chemistry and students usually try to memorize it. For this reason, use of games is important as it facilitates learning and provides quick learning. In literature, it is seen that card game called ChemMend was developed by Centelles and Magnieto (2014) for teaching periodic table, a teaching game called Cheminoes was developed by Moreno, Hincapié and Alzate (2014) and taboo game was developed by İri and Cil (2013). It is stated that taboo game is an effective way to learn properties of periodic table, classify elements and provide permanent learning. In addition, as a result of periodic table bingo game in teaching elements in periodic table developed by Aycan, Türkoğuz, Arı and Kaynar (2002), it is stated that success will increase as practice time increase. It has been determined that high school students will learn names and symbols of elements and compose commonly used components when periodic table is explained though training card game instead of memorizing (Mariscal, Martínez & Márquez, 2012). When considering games developed for teaching chemical subjects, games developed for exploring information on periodic table using atomic and molar mass (Woelk, 2015), teaching compounds with covalent and ionic bonds (Morriss, 2011), learning names and functions of common tools of chemistry laboratory (Kavak & Yamak, 2016) draw attention. Picture Chem developed by Kavak and Yamak, (2016) is played with 30 cards and game board. Strengths and weaknesses of the game were tested quantitatively and it was stated that the game was found useful by students.

It was stated that games to use in solving synthesis problems and reviewing organic reactions related to organic chemistry are specifically effective in placement exams with low level organic chemistry courses and high level organic synthesis courses (Farmer & Schuman, 2016). Again, Carney (2015) developed a card game related to functional groups and reaction types in order to practice on organic chemistry. Wilhelm (2016) developed an appropriate game called as ReMeM:BER so that students could test their knowledge on organic reaction mechanisms. He stated that this game requires a good memory, knowledge on organic reaction mechanisms, strategic thought and chance. For Welsh (2003), it was intended with games such like "Old Maid" and "Go Fish" that students could learn not only names of functional groups but also different ways to represent and match the groups.

Purpose of this study is to design a card game for teaching names and formulas of ions which would form a basis for writing compounds when considering that learning with game would allow students to produce an idea and it would increase their learning responsibilities and accordingly their motivations against learning.

#### METHOD

Names and formulas of commonly used anions and cations have been determined by asking opinions of the experts in chemistry in order to determine ions involved in the game. Pilot scheme conducted in development stage of the game was performed with 49 students in total who studied in Science Teaching, Chemical Engineering, Food Engineering, Pharmacy and took lesson of General Chemistry.

# RESULTS

As a result of the research, ion cards have been developed to teach the names and formulas of anions and cations, which will be the basis for writing and naming chemical formulas of compounds which are one of the important subjects of chemistry. Pink cards shown in Figure 1 were used in order to teach students primarily how to write names and formulas of ions. These cards include both names and formulas of ions commonly used. Monatomic and polyatomic ions are presented together. Students sat in the class according to layout model of classic order. Between each other, they were separated into 6 groups of 8 persons and 1 group of 9 persons. Pink cards were given to the students. They were asked to create a list by teaching them name and formula of ion involved in each card. Figure 1 illustrates examples for ions involved in 82 pink-colored cards in total (45 anions and 37 cations) prepared according to names and formulas of 1 deck.



Figure 1: Anion and cation cards according to their names and formulas

After ion training conducted using pink cards, each student was given small answer sheets enumerated from 1 to 9 in the game played in order that students could reinforce the ions they learned. Among 6 groups, 3 groups were given ion set of purple by the names and other 3 groups were given ion set of orange by the formulas. Each set is composed of 82 ions and 1 student will answer 82 ions. Cards were exchanged between the groups after groups played game they ran into. After students determine the direction of card transfer between each other, each student pulls a card from the ion deck (anion and cation). Then, he writes what he sees on the card without showing the other students and puts it into the box in the middle and then he gives the card he wrote to the next friend in the direction of circle. When the card chosen by a student comes again to the student, 1<sup>st</sup> round of the game will be completed, and cards belonging to that round will be collected and put aside. After that, again everybody choose one card from the closed ion deck in the middle, and 2<sup>nd</sup> round of the game starts. This round continues until all cards in the middle ends. In this way, all cards will have been written by all students. Figure 2 presents the examples for ions involved in 82 purple-colored cards (45 anions and 37 cations) of 1 deck prepared by the names.





Figure 3 presents the examples for ions involved in 82 orange-colored cards (45 anions and 37 cations) of 1 deck prepared by the formulas.



Figure 3: Anion and cation cards according to their formulas

Introduction of the game has been considered in 3 stages and these are;

- 1. Contents of the game set
- 2. Playing the game and rules
- 3. Evaluation of the game results

# 1. Contents of the game set

ESI composed of the following contents:

- $\checkmark$  1 deck of purple-colored anion cards by the names (45 pieces),
- $\checkmark$  1 deck of purple-colored cation cards by the names (37 pieces),
- $\checkmark$  1 deck of orange-colored anion cards by the formulas (45 pieces),
- $\checkmark$  1 deck of orange-colored cation cards by the formulas (37 pieces),
- ✓ Small square answer sheets in different colors for each player (82 pink, 82 blue, 82 green, 82 yellow) on which are coated by press print and which can be deleted and used again and again,
- $\checkmark$  4 erasable marker pens,
- ✓ A non-transparent box in which answers would be put,
- $\checkmark$  4 answer controlling sheets and a small cloth for cleaning the answers at the end of game.

# 2. Playing the game and rules

From the pilot scheme, rules have been developed for ESI. While determining the rules, it is paid attention to prepare a limited number and functional rules in a way to keep them in mind.

- $\checkmark$  4 players sit in a way to create a circle.
- ✓ Each player chooses a color for himself (82 pink, 82 blue, 82 green, 82 yellow) and takes all cards belonging to that color.
- ✓ The box in which the answers written on colorful sheets would be put, is placed equidistantly in the middle.
- ✓ Each player is given one black-colored erasable marker pen into the contents of set.
- ✓ Purple-colored cards consisting of ions (anions and cations) by the names are mixed and put inversely.
- ✓ Each player pulls a card in the middle. He/she writes number and formula of ion over the card he/se chose (anion and cation) on the answer sheet and then put it into the box.
- ✓ In the similar way, orange-colored cards consisting of ions (anions and cations) by the formulas are mixed and put inversely.
- ✓ Each player pulls a card in the middle. He/she writes number and formula of ion over the card he/se chose (anion and cation) on the answer sheet and then put it into the box.
- ✓ In this way, it will be determined which answers belong to which player by the colored answer sheets and which answer is given by a player to which card by the numbering game cards.
- $\checkmark$  Game is completed when all ions cards in the middle end.
- ✓ While player gets 1 point as much as the number of correct answer, he/she gets 0 point as much as wrong or blank answers. Total net point of the player would be as much as the points obtained by the correct answers.
Figure 4 presents a representative graph with regard to playing ESI game.



Figure 4: An illustrative drawing on the playing of the ESI game

# 3. Evaluation of the game results

At the end of the game, players are provided with an analysis sheet prepared as numbered (anions from 1 to 45 and cations from 46 to 82). Players take the answer sheets from the box and put them on the table and then collect their own answer sheets by separating them by their colors. Players are provided with answer controlling sheets consisting of names or formulas of the ions in a numbered way. Each player calculates his/her own point by analyzing numbers of correct, blank and wrong answers and records it on Table 2. Who gets the highest total net point will be the winner. Sequences are prepared as diversified in the sets which are prepared by the names and by the formulas and by both names and formulas in case students could memorize sequence numbers of the ions. Table 1 presents the ions by the formulas on the cards, for example.

$H_2PO_4$	CO <sub>3</sub> <sup>2-</sup>	BrO -	O <sup>2-</sup>	HPO4 <sup>2-</sup>
OH -	BrO <sub>2</sub> -	P <sup>3-</sup>	PO <sub>4</sub> <sup>3-</sup>	NO <sub>2</sub> -
ClO <sub>3</sub> -	N <sup>3-</sup>	Cl -	ClO <sub>4</sub> -	O <sub>2</sub> -
SO <sub>3</sub> <sup>2-</sup>	Br -	ClO <sub>2</sub> -	ClO -	S <sub>2</sub> O <sub>3</sub> <sup>2-</sup>
MnO <sub>4</sub> <sup>2-</sup>	PO <sub>3</sub> <sup>3-</sup>	F-	HSO <sub>3</sub> -	CrO <sub>4</sub> <sup>2-</sup>
S <sup>2-</sup>	SeO <sub>4</sub> <sup>2-</sup>	BrO <sub>3</sub> -	Ι-	Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>
NO <sub>3</sub> -	IO -	Н-	BrO <sub>4</sub> -	HSO <sub>4</sub> -
IO <sub>3</sub> -	CN -	$C_2O_4$ <sup>2-</sup>	IO <sub>4</sub> -	HCO <sub>3</sub> <sup>-</sup>
O <sub>2</sub> <sup>2-</sup>	<b>SO</b> <sub>4</sub> <sup>2-</sup>	SCN -	SeO <sub>3</sub> <sup>2-</sup>	MnO <sub>4</sub> <sup>-</sup>
Be <sup>2+</sup>	Cr <sup>3+</sup>	Au <sup>+</sup>	Co <sup>3+</sup>	Au <sup>3+</sup>
Ni <sup>3+</sup>	Fe <sup>3+</sup>	Fe <sup>2+</sup>	Cr <sup>6+</sup>	Zn <sup>2+</sup>
Co <sup>2+</sup>	Ag +	Cs <sup>+</sup>	Cu <sup>2+</sup>	K <sup>+</sup>
Mg <sup>2+</sup>	$NH_4^{+}$	Pb <sup>4+</sup>	Pb <sup>2+</sup>	Si <sup>4+</sup>
Sn <sup>4+</sup>	Cd <sup>2+</sup>	Hg <sup>2+</sup>	Cu <sup>+</sup>	$Hg_2^{2+}$
Sn <sup>2+</sup>	Sr <sup>2+</sup>	Mn <sup>2+</sup>	Na <sup>+</sup>	Ni <sup>2+</sup>
Al <sup>3+</sup>	Cr <sup>2+</sup>	Li <sup>+</sup>	Rb <sup>+</sup>	Ba <sup>2+</sup>
Ca <sup>2+</sup>	Au <sup>3+</sup>			

Table 1: Ions by formulas on the cards

When Table 1 is examined, it is seen that 82 formulas of ion are included without order. Table 2 presents evaluation of results of ESI game.

Number of	Number of	Number of	Number of wrong	Number of blank	Total net point
Toullu	player	confect answers	allsweis	allsweis	1
	1.	62	13	7	62
1	2.				
1	3.				
	4.				
	1.				
2	2.				
2	3.				
	4.				
	1.				
2	2.				
5	3.				
	4.				

Table 2: Evaluation of results of ESI game

When Table 2 is examined, while player gets 1 point as much as the number of correct answers, he/se gets 0 point as much as wrong or blank answers. Total net point of the player will be as much as the point obtained by number of correct answers. For example, if a player has 62 correct answers, 13 wrong answers and 7 blank answers, then he/she will get 62 net points in total in this case.

#### **DISCUSSION AND SUGGESTIONS**

With this study, educational set of ions (ESI) has been developed in order to teach how to write names and formulas of anions and cations properly. This game is prepared for students who study in different grades of education considering the subject on chemical compounds involving anion and cation teaching within the scope of chemistry lesson at high school and university. As a result of the pilot scheme, ESI was put into final form by making arrangements as regards decreasing amount of students to 4 in the group, having students sitting in a round, designing answer sheets as reusable in press printed to prevent paper wastage and enlarging their sizes a little, and playing the game by collecting the cards couldn't be written properly by students.

The developed ion cards can be used in order to write formulas and names of commonly used compounds. It is written if card is anion or cation on the back side of the cards. Players can write, on their answer sheet, the compound to be formed by one anion card and one cation card of purple-colored cards prepared by the names, and the compound to be formed by one anion card and one cation card of orange-colored cards prepared by the formulas. An expert or class teacher plays a role in evaluating possible compound combinations as the number of them is too much in evaluating the phase to form compounds in order to reinforce anions and cations learned. For example; given that player would choose magnesium ion into the deck of cation and sulphate ion into deck of anion laid randomly from cards prepared by the names. The compound required to be written using this anion and cation by the player is magnesium sulphate. Given that player would choose  $Li^+$  into the deck of cation and  $CN^-$  into deck of anion laid randomly from cards prepared by the formulas. The compound required to be written using this anion and cation by the player is LiCN.

It is considered that the game prepared would make a contribution to increase motivation and knowledge level of students in this regard. When literature is examined, indeed, it is determined that using games in education has a positive effect on success of the student. Educational games are useful pedagogical tools that make learning possible though entertainment (Bayir, 2014). Educational games allow students to develop skills such like creativity, imagination, synthesis as well as they draw catch students' attention and make knowledge permanent (Kaya & Elgün quoted from Kaptan & Korkmaz, 1999, 2015). For Lowe (1988), studies can be conducted on integration toys and games into the education by examining curriculums of primary school and secondary school. Prompting an active learning in an entertaining way out of the ordinary routine in the class and encouraging students to communicate and interact can be shown as some advantages of teaching with games (Kavak, 2012a;b). In the study by Rastegarpour and Marashi (2012) in order to study effect of educational card games and computer games prepared by the teachers on learning of university students in terms of chemical concepts, it was determined that games are effective instruments in education. Similarly, in the study by Samide and Wilson (2014), it was observed that game is a good instrument in understanding.

Some students always want to play more challenging card games (Welsh, 2003). While preparing card games pleasing majority of the class, statements from simple to complex can be put into the set, and thus students leading the class won't find the game simple and won't get bored. Indeed, it is suggested to play the game ideally in 1-3 rounds (1 round, both by name and according to their formulas, 1 round according to their names, 1 round according to their formula) since the game would last long with ESI developed within the scope of study. In addition, ESI game set can be printed and played in different languages (German, French, etc.).

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# The Role of Identity Styles and Locus of Control in Prediction of Self-Efficacy A

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# ABSTRACT

Identity styles and locus of control are of the most important strategic variables in determining the characteristics of people personality, So, this study was conducted to investigate the relationship between identity style, locus of control and self-efficacy among teachers of Khodabandeh city in Iran during the academic year 2014- 2015. Among all teachers in Khodabandeh city during 2014-2015 academic year (419 teachers), 120 were selected using systematic random sampling method. All of them completed identity Style Inventory (ISI), Levenson Multidimensional Scale of Locus of Control and General Self-Efficacy Scale (GSE-10). For data analysis correlation and regression analysis (stepwise) was used. Data analysis showed a significant correlation between teachers' identity style, locus of control and their self-efficacy (p<0.05). Due to the results, it can be concluded that identity style and locus of control can predict self-efficacy in teachers.

### **INTRODUCTION**

Self-efficacy refers to belief of people in their ability to achieve desired goals. The concept of self-efficacy was presented for the first time by Albert Bandura and Adams to present an integrated theory to change behavior (Gallagher, 2012). Moreover, self-efficacy refers to belief and trust of person in his/her ability to show a special behavior even in a suggestive position (Shin, 2011). In fact, meeting desires and needs and behaving based on internal criteria can improve self-efficacy and failure in meeting needs, expectations and goals decrease it. People with low sense of self-efficacy feel disparate and believe that they can't control the events of their life

(Schultz, 2012). Many studies have shown that people with high general self-efficacy are more resistant against problems compared to others (Ghorbani ,Marzooni and NasiriSemnani, 2015). Moreover, studies in field of self-efficacy indicate reverse relationship between it and mental disorders such as depression (Shikayi et al, 2007; Hermann, 2005; Tahmasian and Anari, 2010). Self-efficient people expect success in their work and are focused on this issue that how they can be successful and overcome the problems through this (Sullivan & Atkins, 2009).

The concept of success was presented for the first time by Ericson and was analyzed by other theorists (tabatabaei et al, 2011). Ericson has defined identity as an organized identity of self, created by desired values, beliefs and goals. In view of Ericson, identification is one of the most important tasks of adolescence (Bosch and Cad, 2012). Identity is subjective concept of person about self and is used under titles such as personal identity, social identity, ethical identity, gender identity and so on (Reber, 2001).

People with successful and late identity have more academic achievement than early and disoriented/avoidance identity (HosseinNejad, 2007; quoted from Tabatabaei, 2011). Weak identity can prepare individuals to have negative beliefs. This is because; beliefs such as who I am, what I do and similar beliefs can expose the person to anxiety (Bosch and Cad, 2012). People with informational identity process content of religion deeply and significantly (Clardi and King, 2011). Identity style is one of the main variables that can affect quality of life in adulthood (Micolinser and Shaver, 2009; quoted from Bonder et al, 2010).

Locus of control refers to manner of controlling the environment in view of individuals. In other words, locus of control is a system of beliefs, based on which individuals evaluate their own success and failures based on strengths and weaknesses (Sha'baniBahar et al, 2010). In locus of control, craving, feeling positive control and life satisfaction are effective (VafayiJahan, 2012). Theory of documents is on this basis that people attribute their successes and failures whether to controllable factor or uncontrollable factors. The first group has internal locus of control and the second group has external locus of control (Soleimani et al, 2013). Studies demonstrate that people with high self-control have high quality of life and behavioral health (Swendeman at al, 2014). Moreover, those who feel that they can affect their life events (internal source) have higher health and adaptability than those with externallocus of control and show more desirable behaviors than them at the society (Owrangi et al, 2011). On the contrary,Arazzini& Walker (2014) believe that people with external locus of control have higher self-efficacy than the people with internal locus of control. According to important role of sense of self-efficacy of teachers as a class in interaction with students, this study has investigated role of identity style and locus of control with self-efficacy of teachers.

#### METHODOLOGY

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The research method in this study is correlation method and statistical population consists of all teachers (n=419) of Khodabande City in different educational levels in public and private schools and schools for disabled people during academic year 2014-2015. Sampling method has been in kind of systematic random sampling based on list of schools, out of which 120 individuals have been selected as sample using systematic random sampling method. All participants fulfilled demographic questionnaires and Identity Style Inventory of Berzonsky (IISI) and Lonson's multidimensional scale of locus of control and General Self-efficacy Scale (GSE-10). For purpose of data analysis, correlation test and regression analysis (stepwise regression) have been applied.

#### INSTRUMENTS

Demographic questionnaire: the questionnaire has been made by the author and measures demographic information of samples.

**General self-efficacy scale (GSE-10)**: in order to measure the variable, GSE has been used. The test has been implemented for the first time in 1979 by Schwartz and Jerusalem to evaluate general and social self-efficacy including 20 items and 2 subscales of general and social self-efficacy. By 1981, Schwartz and Jerusalem revised the test and decreased its items to 10 items. The current scale of self-efficacy beliefs includes 10 items to measure level of general self-efficacy. The test is a self-reporting instrument for adults and trails should announce their agreement or disagreement with each item using Likert 5-point scale from totally false to totally true. The scale can be used in different samples such as evaluation of variations of quality of life of patients before and after surgery or patients with chronic pain or those who are on a rehabilitation schedule. Scoring method of this scale is as follows: score 1 is considered for totally false option; score 2 for hardly true option; score 3 for almost true and score 4 is considered for totally true option. In order to obtain test score, scores of 10 options are added. Range of probable values of the test is placed in a range of 1-40. Reliability coefficient of the scale has been reported to 0.88 in Canada, to 0.81 in Germany, to 0.82 in France, to 0.91 in Japan, to 0.85 in Indonesia and to 0.75 in India due to cronbach alpha. Validity and reliability of the instrument in Iran has been also reported to 0.84 in Shahid Chamran University of Ahwaz and to 0.08 in Marvdasht by Rajabi (2006).

Berzonsky's Identity Style inventory (ISI): ISI of Berzonsky (ISI-6G) contains 40 questions and 3 subscales of informational, normative and disoriented/avoidance identity styles. The inventory has been revised and



modified by White et al by 1998. White et al (1998) have tested the inventory on 361 students and have reported alpha coefficient to 59% for informational identity style; to 64% for normative style and to 78% for disoriented/avoidance style. Hence, the inventory has acceptable internal consistency. White et al (1998) have also investigated validity of the inventory using original and old version and have demonstrated that correlation between the two subscales of informational style is equal to 81% and it is equal to 85% for normative identity style and to 85% for disoriented/avoidance identity style. Ghazanfari, 2004(quoted from Seraj Khorami and Mo'azamfar, 2008) has conducted a study with the aim of validation and normalization of the inventory in Iranian population. For purpose of testing its internal consistency, they have estimated Cronbach alpha on original data and obtained results from the test of internal coefficients are as follows: informational style: 67%: 67%; normative style: 51%; disoriented/avoidance style: 62%. The coefficients indicate that Berzonsky's Identity Style Inventory has considerable reliability and consistency in Iranian population. In a study in Iranian population, Cronbach alpha is obtained to 71%, 53% and 65% respectively for informational style, normative style and disoriented/avoidance styles (Tabatabaei et al, 2011).

**Levenson Multidimensional Locus of Control Scales**: the scale is in kind of paper-pen type and includes 3 scales and totally 71 items focused on different roots of locus of control. In this scale, each scale is regulated in form of Likert's 5-point scale and answer range from totally disagree to totally agree. -1, -2 and -3 are related to disagreement and +1, +2 and +3 are related to agreement. Total score for each variable of I, P and C is total score of each trial in question 8 related to the subscale, which is added to number 71 to eliminate its minus sign. Therefore, in each scale, range of scores is from 6 to 18. High score in each subscale is interpreted in this manner that people have high expectation from control with desired root (Levenson, 1989; quoted from Farahani). Reliability coefficient ofKuder Richardson for variable I, P and C is respectively equal to 62%, 66% and 64%. Reliability is reported between 60 and 79% using retest with the interval of 1 week.

# RESULTS

Applied method in this study is correlation method. As manipulation of studies is impossible in this study and the purpose is investigation of relationship among several variables, regression analysis (stepwise regression) is applied for purpose of data analysis.

Descriptive data about some information of participants have been presented in table 1. Various studies data such as gender, education level and education grade desired in this study considered in data analysis are presented in table 1.

	Gender			Educati	Education			Grade			
	Female	Male	Total	Post- diploma	BA	MA and higher	Total	Elementar y	Secondary	High school	Total
Frequency	38	82	120	29	84	7	120	42	32	46	120
Percent	31.7	68.3	100.0	24.2	70.0	5.8	100.0	35.0	26.7	38.3	100.0

Table 1: Demographic information of participants

According to table 1, number of female teachers is equal to 38 people (about 32%) and number of male teachers is equal to 82 people (about 68%). Largest number of individuals with BA degree is equal to 84 people equal to 70% and lowest number of individuals with MA degree is to 7 people equal to 6%. Also, the largest number of people in high school grade is equal to 46 to 38% and lowest number in secondary school grade is to 32 people equal to 27%.



Predictor variables	R	Р
Informational identity style	0.268**	0.002
Normative style	-0.164*	0.037
Disoriented/avoidance style	-0.154*	0.047
Commitment	0.221**	0.008
Powerful people	0.207*	0.012
Chance	-0.072	0.218
Internal control	0.174*	0.029

Table 2: matrix of correlation coefficient of predictor variables with self-efficacy

\*=p<0.05; \*\*=p<0.01

As it is observed, except for chance, other remained predictor variables are in significant correlation with selfefficacy.

Table 3: results of	variance analy	sis obtained	from regressio	n of 4 models
	2		0	

Model	Variance	Sum of	df	Mean	F	Р
	sources	squares		squares		
1	Regression	121.025	1	121.025	9.150	0.003
	Error	1560.675	118	13.226		
	Total	1681.700	119			
2	Regression	200.501	2	100.250	7.919	0.001
	Error	1481.199	117	12.660		
	Total	1681.700	119			
3	Regression	287.473	3	95.824	7.973	0.000
	Error	1394.227	116	12.019		
	Total	1681.700	119			

The data in table 3 preset the results of variance of 4 models. In model 1, it is obvious that obtained F value is significant in confidence level of 1% (p=0.003, f (1.119) = 9.150). Therefore, it could be found in confidence level of 99% that there is significant correlation between variable of informational identity style and general self-efficacy. Independent variable (informational identity style) has the ability to predict the criterion variable. In model 2 as it is clear, obtained F value is significant in confidence level of 1% (p=0.001, f (117, 2) = 7.919). Therefore, it could be found in confidence level of 99% that there is significant correlation between variable of powerful individuals and general self-efficacy. Also, independent variable (powerful individuals) has the ability to predict criterion variable. In model 3, obtained F value is significant in confidence level of 1% (p=0.000, f (3.116) = 7.973). Therefore, it could be found in confidence level of 99% that there is significant correlation between variable of the ability to predict criterion variable. In model 3, obtained F value is significant in confidence level of 1% (p=0.000, f (3.116) = 7.973). Therefore, it could be found in confidence level of 99% that there is significant correlation between variable of chance and general self-efficacy. Also, independent variable (chance) has the ability to predict criterion variable.

Table 1: coefficients of stenwise regression analysis	

Model	Component	Non Std. coe	efficients	Std. coefficien	ts	
		Slope	Std. error	Beta	Т	Р
		coefficient				
		(B)				
1	Constant	27.908	1.217		22.931	0.000
	Informational identity style	0.088	0.029	0.268	3.025	0.003
2	Constant	24.671	1.757		14.042	0.000
	Informational identity style	0.091	0.028	0.276	3.182	0.002
	Powerful individuals	0.103	0.041	0.218	2.506	0.014
3	Constant	26.402	1.829		14.436	0.000
	Informational identity style	0.092	0.028	0.280	3.315	0.001
	Powerful individuals	0.174	0.048	0.367	3.627	0.000
	Chance	-0.127	0.047	-0.272	-2.690	0.008
4	Constant	29.350	2.325		12.626	0.000
	Informational identity style	0.102	0.028	0.313	3.676	0.000
	Powerful individuals	0.152	0.048	0.321	3.135	0.002
	Chance	-0.137	0.47	-0.292	-2.908	0.004



According to significance level of F in variance analysis table and t in table 4, regression equation for model 1 is presented as follows.

According to slope value, the higher the level of informational identity style is, the more value it can predict for self-efficacy.

Moreover, according to obtained results from table 4, it could be observed that T-value related to variable of informational identity style (3.025) is significant in confidence level of 1%. This issue refers to direct and significant correlation between informational identity style and general self-efficacy. According to standard B related to informational identity style (0.268), it is found that per one unit variance in variable of informational identity style, variable of general self-efficacy is increased to 0.268.

According to slope value, the higher value of powerful individuals is, the more it can predict self-efficacy for teachers. Moreover, due to obtained results from table 4, it could be found that T-value related to variable of powerful individuals is equal to 2.506 and significant in level of 0.05. This refers to direct and significant correlation between powerful individuals and general self-efficacy. According to standardized B related to powerful individuals (0.218), it could be found that per one unit variance invariable of powerful individuals, general self-efficacy is increased to 0.218.

According to slope value, the more the level of chance is, the less value it can predict for general self-efficacy. Moreover, due to obtained results from table 4, it is found that T value related to chance is equal to -2.690 and is significant in level of 0.01. This refers to direct and negative correlation between chance and general self-efficacy. According to standardized B, per one unit variance in chance, the general self-efficacy is decreased to 0.272.

# Hypothesis 1: there is significant and positive correlation between informational identity style and general self-efficacy.

According to data of table 2, estimated correlation coefficient is significant in level of 0.01 (p=0.002, r=0.268) and this indicates that there is significant and positive correlation between informational identity style and general self-efficacy. In other words, the more the informational identity style is increased, the more general self-efficacy would be.

# Hypothesis 2: there is negative correlation between normative identity style and general self-efficacy.

According to data of table 2, calculated correlation coefficient is significant in level of 0.05 (p=0.037, r=0.164) and this indicates that there is significant and negative correlation between normative identity style and general self-efficacy. In other words, the higher normative identity style is, the lower genera; self-efficacy would be.

# Hypothesis 3: there is significant and negative correlation between disoriented/avoidance identity style and general self-efficacy.

According o data f table 2, estimated correlation coefficient is significant in level of 0.05 (p=0.047, r=0.154) and this shows that there is negative and significant correlation between disoriented/avoidance identity style and general self-efficacy. In other words, the more the disoriented/avoidance style is increased, the more general self-efficacy would be increased.

Hypothesis 4: there is significant and positive correlation between commitment of identity style and general self-efficacy.

According to the data of table 2, estimated correlation coefficient is significant in level of 0.01 (p=0.008, r=0.221) and this indicates that there is significant and positive correlation between commitment of identity style and general self-efficacy. In other words, the more the variable of commitment of identity style is increased, the more general self-efficacy is increased.

# Hypothesis 5: there is significant and positive correlation between locus of control of powerful individuals and general self-efficacy.

According to data of table 2, estimated correlation coefficient is significant in level of 0.05 (p=0.012, r=0.207) and this indicates that there is significant and positive correlation between locus of control of powerful individuals and general self-efficacy. In other words, the more the locus of control of powerful individuals is increased, the more general self-efficacy is increased.

# Hypothesis 6: there is negative correlation between locus of control of chance and general self-efficacy.

According to data of table 2, estimated correlation coefficient is not significant (p=0.218, r=0.072) and this indicates that there is no significant correlation between locus of control f chance and general self-efficacy.



#### Hypothesis 7: there is positive correlation between internal locus of control and general self-efficacy.

According to data of table 2, estimated correlation coefficient is significant in level of 0.05 (p=0.029, r=0.174) and this indicates that there is significant and positive correlation between internal locus of control and general self-efficacy. In other words, the higher the internal locus of control is, the higher general self-efficacy would be.

According to these results, it could be mentioned that type of identity style an type of locus of control can predict self-efficacy of teachers.

# DISCUSSION & CONCLUSION

Obtained results from the study show that there is significant correlation between identity style and locus of control of teachers and their self-efficacy. This finding has been in consistence with study of Kasraei et al (2014) under the title of investigation of the relationship of intellectual capital, identity styles and identity commitment with self-efficacy of High School teachers of Ashnuve City. This study had found that disoriented/avoidance identity style (negatively) and identity commitment (positively) can predict self-efficacy beliefs of teachers. The finding has ben also in consistence with results of Hejazi et al (2014) under the title of the relationship between identity styles and ethnical identity with academic self-efficacy of Kurd Students the results of this study have shown that there was positive and significant correlation between informational and normative identity style and ethnical identity with academic self-efficacy. Moreover, obtained results from this study have been in consistence with study of Mohammadi Nasab (2014) under the title of investigation of the relationship between identity styles and control of emotions with academic self-efficacy in high school students of Isfahan. The study found that there was positive and significant correlation between identity styles and academic self-efficacy. The findings have been also in consistence with results of Joe and Hens (2012) who found that people with disoriented/avoidance identity style are unable to make intimate and continuous emotional relationships with others. The findings have been also in consistence with findings of Maghsodi et al (2015) under the title of the relationship between identity style and academic situation of students of Medical University of Gilan and study of Molaei et al (2014) under the title of investigation of the relationship of 5 main factors of personality and locus of control with job satisfaction of staffs of Kermanshah Gas Company, which found that there was significant correlation between the mentioned variables. Moreover, findings of the study have been in consistence with results of Slesnick et al (2011) and Light Foot et al (2011), which were adopted separately and indicated that people with internal locus of control are exposed to social damages. The findings have been also in consistence with finings of Gharetappe et al (2015) under the title of the relationship between individual and social adaptability with locus of control and gender in clever high school students of Kermanshah and in consistence with findings of Ramdin (2011) under the title of comparing identity style and academic performance in first year psychology students, which indicated that there was negative and less significant correlation between normative identity style and academic performance of students. The findings have been also in consistence with results of Leader (2012) based on existence of negative correlation between informational identity style and academic achievement directly and indirectly. However, obtained results from this study have not been in consistence with findings of Arazzini& Walker (2014), which refer to existence of positive correlation between internal locus of control andhigh self-efficacy.

#### CONCLUSION

According to obtained results, it could be mentioned that identity style and locus of control of teachers can predict their self-efficacy and this finding is significant statistically.

# ACKNOWLEDGEMENT

Authors would like to appreciate all teachers and officials of schools, who have helped them in any way to provide this research.

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# Use of Digital Technology in T-the Development of the Competence of the Textual Production of Short Stories in Class of Literacy

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# ABSTRACT

We witness an age where modern communication technologies (ICT) have all but taken over the school environments; moreover advances in digital learning environments, using different technologies, such as the Internet, iPads, and/or tablets have shown us new perspectives on education. Using the simple transposition of content and methods from conventional teaching to modern technologies, this study seeks to analyze whether the incursion of technology, that being iPad use, may favor the development of children's competence in written textual production of short stories in literacy classes. Moreover, is it possible to state that the innovative use of ICT in schools interferes in the written textual competence of students in literacy class in comparison to the use of paper? I have selected three research methods to conduct this study, literary, field research and analytical. The first is necessary since I have dealt with textual genres theories, specifically theories regarding the story or tale, and the short story or short tale. Furthermore, I have used field research by proposing a short story writing assignment to two second-grade-elementary-school classes, with 39 students altogether, from a private school in the city of Londrina-PR, Brazil, and finally analytical research since I thoroughly analyzed and reflected upon the results of the field studies. The results have showed that children in literacy phase - and we may apply these results to a considerable portion of Brazilian children of the same schooling cycle - show facility handling digital tools, which provides security in the writing process. Manual writing presents difficulties, such as hypersegmentation and oscillation in handwriting and letter size. These difficulties do not occur using the digital tool. I have noticed that virtual writing is optimal; moreover, it is associated with other communication resources, such as orality. Furthermore, new modalities of writing are new possibilities of evolution in the literacy process, through the simple action of "typing/clicking" on the iPad's screen keyboard and thus, literacy takes on a new garment through the "navigation", making it easier for children to read and interpret. Keywords: Literary Genre. Literacy. Technology

# INTRODUCTION

The challenge of literacy is to comprehend what children need to achieve; and the skills they consciously develop. This process demands arduous, constant and properly planned work. Teaching letters, syllables, forming words and realizing that the student is suddenly writing, transforms the act of learning into moments of pleasure, setting new architecture in the school environment. Signs transformed into alphabet, gradually become significant until they act considerably in the context of reading. Therefore, the school becomes an instrument of social promotion, allowing the propagation of new knowledge. Thus, literacy is the core content of school life whose function is to incorporate social culture into children's daily life.

Nowadays, we increasingly use new technologies optimizers for writing in literacy classes aligned with the methodological proposals that go beyond the sole use of paper in counterpoint to the inclusion of technological resources. Technology has made possible the experience of being a student in the virtual world, facilitating and making the teaching and learning process pleasant. When inserted in the school context, Information and Communication Technologies (ICT) have brought new possibilities for interacting and building knowledge.

Thus, this article seeks to analyze if a technology can favor the development of the competence of written textual production, using short stories in literacy classes. It also analyzes if it is possible to consider that the ICT used in schools with innovative purposes interfere in the competence of written textual production of students in literacy class in comparison to the use of paper. I chose the textual genre short stories because it encourages students to



write in the literacy stage, once, as the name itself implies, it is a short story of approximately 200 characters. This genre presents other numerous traits; however, on this research I only analyzed the narrator, the characters, space and time.

# LITERACY AND READING SKILLS TEACHING

The renovating movement of education - called Escola Nova (new school), began in the late nineteenth century, and valued reading, libraries and the taste for books. It brought an important contribution to literacy educators: the defense of the global method, and according to it, the child has a global vision, as the name itself refers to, perceiving the context, the entire set, before dwelling on details.

Decroly emphasized the understanding of the meaning from the earliest stage of literacy, not the ability to decode or say the text aloud, according to Carvalho (2014, p. 31). He considered that traditional methods of spelling and syllabication contravened the globalization function characteristic of the infantile mind. One of the earliest global methods is to begin teaching reading from small stories adapted or specially created by teachers. He believed that literacy educators should start by reading stories or phrases to reach the recognition of letters or sound, contrary to synthetic methods, that is, the fastest, simplest and oldest literacy methodology. This method establishes a correspondence between oral and written comprehension.

According to Carvalho (2014, p.32), after presenting the complete story, the text is broken up into sentences, which children learn to recognize and repeat, in a kind of pre-reading. The next step is recognizing words (in general, certain words appear repeatedly, which facilitates memorization). Only after that, it is possible to reach the stage of the division of words into syllables and finally the composition of new words with the syllables studied.

This method, called global, came became popular in the 1920s to 1970 as the most suitable for children's learning to read and write. With the process of implementation of the entry of children with the age of 6 in Elementary School, in 2006, adjustments were made in Basic Education, as well as the expansion and intensification of the time for the development of learning aimed at literacy over the first three years.

This way, the concern with the literacy process is a topic of discussion among literacy teachers, becoming more and more a challenge due to the methodological issues extracted from the practical experiences, the way of thinking and acting from observations made in the school.

In the literacy stage or pre-literacy, children make contact with children's literature full of curiosity and willingness to listen, playfully engaged with poems, tongue-twisters and folk songs. Through the mediation of adults, they hear stories and follow them through illustrations. In possession of the reading codes, it modifies its status, immersing in the universe of the written word. The domain of reading and, consequently of writing, allows them to appropriate a knowledge that throughout their life qualifies, that is, increasing to make them autonomous and free to make her own choices.

When it time to introduce the systematic teaching of reading, the theme of the text chosen is decisive. According to Breda (2009, p. 1), it is necessary to offer texts to children already in the first activities of literacy, because understanding their uses and their functions favors the reflection on the writing system. Learning to read presupposes learning that letters have sounds. Children are able to read when they understand how the letters work to represent the sounds of the language, perceiving what the word means, and gradually interpreting the sentence they read.

Piaget states that the determinant of learning is the learner himself, that is, the learner constructs his own knowledge, proposes to reflect on the fact that it is more important to understand how children learn than to know how to teach children to read and write.

Understanding the central role of reading is a basic and fundamental condition for quality teaching and learning in school. However, while most of the activities applied in school are related to reading, it is not always read to learn how to read, but rather to an end that is unique and therefore may be different for each individual.



Carvalho (2014) states that in order to learn to read, one must know the letters and sounds they represent, but it is also fundamental to seek their meaning, to understand what is written. As a subject of their own learning and interaction with the other subjects, children begin to relate reading to their reality, making it meaningful. In this way, we can use texts to focus on both facets of learning: literacy and initial reading instruction.

# From literacy to digital literacy

Nowadays, the pedagogical action that corresponds the most to the social reality that we are living is the one that contemplates in an articulated and simultaneous way the process of teaching children the letters, once they are processes of different nature, with specific abilities and competences, that imply forms and differentiated procedures, yet interdependent and inseparable.

Soares (2012, p.47) considers literacy as "a state or condition of those who not only can read and write but cultivate social practices that use writing". By understanding how the writing system and its conventions work, children begin to analyze and recognize the sonorous segments of words. In this way, literacy is a condition of those who not only can read and write, but the one who can participate in varied experiences with reading and writing, interacting with different textual genres. Digital literacy, for the same author, is understood as a "state or condition acquired by those who embrace the new digital technology and practice reading and writing on the screen, different from the state or condition of literacy of those who practice reading and writing on paper "(SOARES, 2002, p.151).

Comprehending the difference between literacy in the perspective of the initial reading instruction means to equip children to be able to use multiple languages, including digital literacy, in order to allow them to integrate the technological processes incorporated into the routine of the classroom. With the advancement of technology, the representation of the act of writing, from the manual artifact to the intellectual becomes modified:

[...] Writing is an intellectual activity carried out by means of a manual, printed or electronic graphic artifact to record, communicate, control or influence the conduct of others, which enables the production not only of reproduction, but also supposes both an effect of distancing and aesthetics (TEBEROSKY, 2006, 24).

Based on this premise, the use of the literacy as in initial reading instruction overlaps and is often confused with literacy. Soares (2012, p.17) considers that literacy as in initial reading instruction brings social, cultural, political, economic, cognitive and linguistic consequences to either the social group in which it is introduced or to the individual who learns to use it. In other words, for individuals and groups who appropriate writing, making it become part of their lives as a means of expression, communication, and interaction. Therefore, he considers literate the individual who has sufficiently grasped writing and reading to the point of using it with competence, with specificity to account for their personal, social and professional responsibilities.

In order to literate, there must be an intentional work of sensitivity, as Carvalho points out (2014, p.69), through specific communication activities. At this stage, teachers should help children to understand the requirements of writing variations, according to the genre of text, the potential reader, and the author's goals.

The author also emphasizes that becoming a literate, or forming a reader, is a complex process that involves learning about authors, their ways of thinking, intentions, interlocutors, ideas and values; it is also to learn about genres, about how texts are organized, from the title, obey certain conventions, and unfold paragraph to express ideas (CARVALHO, 2014, p.70-71).

Children progress in their literacy and initial reading when they are exposed to activities in which they need to combine oral and written language, when stimulated to participate in activities with texts and words, which go from simple to more advanced activities. Digital literacy considers the need for individuals to master a set of intellectual skills and information that is necessary in any school in order to empower children as quickly as possible, making writing more effective. According to Frade (2011), digital literacy implies both the appropriation of a technology and the effective exercise of writing practices that in the digital environment.



Ferreiro (1994, p.41), a renowned researcher in the field of literacy, questions: "When it comes to the new technologies that are emerging, who will be the reader of the XXI century?". Creating textual narratives in the digital format is part of the current literacy process. Digital narratives in literacy can be worked with different educational technology, information and communication resources. Digital literacy enhances and contextualizes the literacy process by helping the learner to create the narratives more easily.

New tools besides the conventional manual ones (paper, pencil, pen) are necessary to develop different ways of literacy. According to Rojo (2012, p. 13), the concept of multilevels points to two specific and important types of multiplicity present in our societies, especially urban ones, in contemporaneity: the cultural multiplicity of populations and the semiotic multiplicity of texts, which informs and communicates. In the same way, texts are losing their linear characteristic, nowadays we seem them as hyper: hypertexts, hypermedia, interactive, collaborative and hybrid, and once reading them, the reader wanders through different media while in cyberspace. According to the socio-interventionist teaching and learning conception, the formation of critical, reflective and active students is a priority, expanding the possibilities of education. Thus using information and communication technologies, we expanded the student's protagonism, making him or her in control of their own learning process.

According to Xavier (2002), digital literacy considers the need for individuals to master a set of information and mental skills that must be urgently addressed by educational institutions in order to enable students to live as real citizens in this new Millennium, increasingly surrounded by electronic and digital machines. Soares (2002, p.151) states that the screen is considered a new space of writing and brings significant changes into the forms of interaction between writer and reader, between writer and text, between reader and text and even between human being and knowledge.

Soares (2002, p.155-156) further states that this need for pluralizing the meaning of the word literacy and, therefore, the phenomenon that it designates has already been recognized internationally. It now designates different cognitive, cultural and social effects according to the contexts of interaction with the written word, sometimes because of various and multiple forms of interaction with the world - not only the written word, but also visual, auditory, spatial communication. A digitally literate person needs the ability to construct meanings from texts that make up words that connect to other texts, through hypertexts and links, pictorial and sound elements. He also needs to be able to locate, filter and critically evaluate information made available electronically, and be familiar with the rules governing communication with other people through computer systems. In other words, a shift from alphabetic to digital literacy is now well-known. New times require new literacy. For Xavier (2007), the alphabetic is serving as support for the learning of digital literacy. In the age of information the variety of knowledge that is generated in the networks, the acquisition of alphabetical literacy becomes a means to achieve citizenship. This means that an individual can only fully utilize the advantages of the digital age to his needs if he has mastered the alphabetical system to the point of being qualified to critically and socially appropriate digital literacy. literacy becomes a means to achieve citizenship. This means that an individual can only fully utilize the advantages of the digital age to his needs if he has mastered the alphabetical system to the point of being qualified to appropriate the digital literacy critically and socially.

# **TEXTUAL GENRE – SHORT STORIES**

The textual genres are linked to the cultural and social life of a people. They contribute to organize, organize and establish the communicative activities of the day to day. There is an explosion of new textual genres that exist today in relation to the written communication of previous societies. By multiplying themselves, the textual genres present themselves with new characteristics, but old bases, both in orality and in writing, facilitating the communication interfaces. Technology emerges to favor the emergence of innovative forms and to be a social, historical and cognitive activity that have characteristics determined by style, content and properties that qualify the human communicative activities.

Working with textual genres is a way of putting into practice the official proposal of teaching of the National Curricular Parameters that insist on this perspective as Marcuschi (2003, p. 3) states: "the appropriation of genders is a fundamental mechanism of socialization, of practical insertion in human communicative activities ". In a comparative study, the author defines textual genres as:

[...] 1. concrete linguistic achievements defined by socio-communicative properties; 2. They constitute empirically accomplished texts fulfilling functions in communicative situations; And finally, 3. Its designation covers an open and virtually limitless set of concrete designations determined by the channel, style, content, composition, and function (MARCUSCHI 2003, 23).

Digital communication has created new genres and perfected others, proving that they are increasingly at the service of the speakers and the needs of their time. For example, long ago people sent letters; they currently send e-mail and messages through whatsapp, which are now virtual adaptations of the handwriting card where paper and pen were used. Despite the modernization of the media, communication and the way in which we express ourselves continues to follow preexisting parameters that establish themselves in a dialogical relation, preserving their genuine characteristics.

According to Santos (2013), "within a given discursive domain, each person constitutes, identifies himself and is socially prestigious for the text he produces and for the demonstrated competence for such activity. Considering the variety of discursive domains that form the society, a particular discursive domain is constituted, identified and achieved social valorization by the quality with which it produces its set of texts. In this way, we realize that the digital writing has increasingly impacted the identity of the subject / author, causing even a revolution in the linguistic area, providing the appearance of new textual components.

Tales or short stories, according to their historiography, are the oldest literary textual genre of all, originated from orality, from the simple act of telling something to a group of people. We see below what a renowned author states that the tale is.

[...] the narrative genre that most closely followed technological innovations in the last twenty years. Today, short stories, (...) and although their contributions have been substantial, other authors have rewritten the story of the tales and put their names in the fictional foundations and the theorization of the short narrative (MARTINS, 2011, pg. 274)

One of the characteristics of contemporary literary production is the propagation of one of the simplest narrative forms: the tale. Because it is a short narrative, it presents the following characteristics: few characters, conciseness, and linearity - that does not allow complications in its plot to briefly develop the focus of the story.

To work the literary textual genre "tale", in the literacy classes of the second grade of elementary school, I used the version "short stories". This is a genre of typically narrative and extremely short texts that must contain in it all the techniques of the tale, in other words, few characters, conciseness, and linearity, which does not allow complications in its plot in order to briefly develop the focus of the story.

By listening to a short story, children begin to expand their vocabulary, expressing themselves initially with the context that comes close to their reality, and then broadening it to subjective or imaginative dilemmas and problems.

[...] Short story readers are primarily narrative readers. People who find, in fictional narratives, a space for reflection on reality, which seek scenarios created by the imagination of others as a way of escaping the stressful reality in which they live or who read for the pleasure provided by the fictional texts (ABAURRE; PONTARA; FRANCO, 2013, P. 10).

The inspiration for short stories is the same for longer texts, life, routine, a look, a smell, a fear, a hope, an image. This way, the introduction to the universe of reading via short stories, appear as a facilitator of the ability to interpret phrases, in this case small texts full of charms or mysteries, amusing and instigating children for creativity and the pleasure of reading.

A short story contains endless possibilities for learning, especially nowadays when children easily lose focus. The achievement of the reader between the ages of 6 and 8 years old is based on the delightful relation that short stories presents, where dream, imagination and fantasy take over, mixing with reality, experiencing emotions from the recognition of the characters, of the time and space expressed in the implicit context of the text.



#### METHODOLOGY

This study intends to analyze the development of children producing "short stories" through the inclusion of digital / technological tools as a facilitator of the writing process and a new methodological approach. Therefore, the types of research selected for this study were: the bibliographical one, since it crosses the theory on genres, regarding to tales and short stories, the literacy process, the comprehension of literacy and the advance for digital literacy. The field research, since it was applied in two second-grade-elementary-school classes of a private school, in the city of Londrina, Paraná. Finally, analytical research, once the results obtained are object of reflection and analysis.

With the aim of producing short stories genre with the aid of digital / technological tools in the writing process, I selected two classes in Elementary School. The following activity proposal was presented: the oral presentation of the textual genre short stories, and different written examples to 39 students from two second-gradeelementary-school classes, from a private school in the city of Londrina-PR. Sixteen students were part of class A and produced their short stories using the app "caderno" (notebook) on their iPads, available in the app store. Twenty-three students from class B produced in the conventional form of writing - paper and pencil. The activity was divided into two parts: firstly, the textual genre **short stories** was presented orally to students so that they understood the constituent elements and managed to construct the mental representation of the focused communication situation, in order to make explicit their initial ideas as an attempt to also produce the studied genre orally. Secondly, I requested the textual production of a **short story** individually.

I arranged the students in a circle so that I could I initiate the activity in a playful way. At this moment, I presented the concept of tale and short stories and its difference, and then I instructed the students on the structural requirements that a short story should present. Once they understood the structure, I presented them reports of short stories created in determined time, using common situations of the school life to which they are inserted. After that moment, I showed them simple images, such as the cover of a history book, which would help them create a short history. After each short story telling, I invited the children to answer interpretive questions, for example, what do you see in this picture? What is the character doing? Always focusing on the structure of the invented short stories. Finally, I invited the children to think of a brief story and, when they were ready, they would tell their classmates. I also offered them images with drawings, for example, storybook covers, among others, and then I projected them in a projector to facilitate the creation from the same short stories. I presented to both groups several short stories with the intention of motivating them to participate in the activity that would require of them the development of intellectual abilities, as well as creativity.

Before beginning the written production, I had to evaluate the level of alphabetical knowledge in which the students were, to arouse the interest by the storytelling and, finally, to insert them in the process of writing. According to Santos (2001), it is important to present to the students a copy of the genre that is about to be read and understood, to promote questions for reflection. Only after that, we should request the production of the genre studied, which in the case of the sample group, when using the iPad technology, it was necessary to verify if they knew the order that the letters appeared on the virtual keyboard. I also presented them the notebook application that allowed them to make notes using keyboard or handwriting and drawing insertion. For the group that used paper, I distributed an A4 type paper with lines so that they could write, and I did previously the production, the alphabetical survey.

#### **RESULTS AND DISCUSSION**

In this section I have analyze the text productions of the short stories of the 39 students that participated in the research. According to the application of the proposed activity - model annex - I noticed that the students presented some situations such as:

In manual writing: excessive use of the eraser, hypersegmentation of words, oscillation between uppercase and lowercase letters; oscillation between the cursive letter and the upper case letter; In their process of creation, they were able to use tales characteristics, such as: few characters, conciseness, and linearity. These characteristics do not allow complications in plot to briefly develop the focus of the story and the inviting title.

Nine out of twenty-three students, (in 39.1% of the cases) could not understand the plot of the story due to writing in the literacy process; 60.9%, or 14 students, were able to accomplish the basic characteristics of the short story such as: few characters, conciseness and linearity. These characteristics do not allow complications in the plot of the story and the inviting title, despite the oscillation in the letters typeface and hypersegmentation.

In digital writing: 16 students participated in the activity using a digital iPad, with the notebook application. 13 students out of 16 16, (in 81.3% of the cases), were able to finish their textual production using the genre short stories; 18.7%, 3 students deleted the activity without saving. It is possible to observe great ease in handling the equipment, including inserting capital letters, spacing and accentuation. Therefore, 13 students were able to accomplish the activity by using the characteristics of a short story such as: few characters, conciseness and linearity. These characteristics do not allow complications in the plot of the story. However, they forgot to add a title to the text.

Short stories written by the students from 2th grade-class A



# Short stories written by the students from 2th grade-class B

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The data analyzed show that when using ICT in the classroom, with the supervision of the teacher, the students found a motivating element of learning, expanding the creative process, once they did not have to worry about the writing process , that is, what type of letter to use, upper case or cursive.



The results obtained indicate that, among the general characteristics expected, the adequacy to the genre was easily achieved, that is, they were able to describe actions, events and situations highlighting with fidelity the presented themes, even if a title does not appear as in the case of students who used the application on the iPad.

Therefore, I concluded that the children in this study in the literacy phase presented an ease in digital management, providing security in their writing process. The characteristics presented in the manual process such as hypersegmentation and oscillation between the letters does not occur in the digital tools. I also noticed that in the children used in the study, the writing is benefited when they used the keyboard, since the student uses the fingers to type, instead of drawing spelling, simply choosing the letters available to compose a word, that is, a finite set with a different order other than the alphabetical, presented in the conventional method. Therefore, the new forms of writing are now configured as new possibilities of evolution in the literacy process, through the simple action of "typing / clicking" on the screen of the keyboard of the iPad and that the literacy takes on a new garment through "navigation" facilitating reading and interpretation.

In these new technological supports, the contemporary apprentice writes on the screen to express his thoughts, his ideas, builds his characters and gives meaning to his experiences, extrapolating the geographical and temporal limitations.

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# Using Activity Worksheets to Unearth 10<sup>th</sup> Grade Students' Perceptions about word Chemical Equations

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# ABSTRACT

An in-depth constructivist and interpretive study was carried out with 31 students from a Ghanaian High School over a period of three weeks in order to elicit their interpretations, concerns, and constructions of word equations. This was a qualitative research to generate, analyse, and interpret data from individual narratives and translate ideas belonging to a community to represent discourses of that community. Results indicated that psychological, cognitive and language issues affected students' conception. Their capacity to reason was linked to both concept, structure and strategies for presenting analysis.

# INTRODUCTION

School chemistry has been an uphill task for students' whose basic principles about chemical phenomena are misconstrued. The foundations of such students have been built on faulty beginnings either from their interactions with their environment before the introduction of authentic formal science or from text books and teachers. In addition, most chemical principles are abstract and as such would require concretisation to enable students to form mental models in order to alleviate their abstractness (Hanson, 2016).

In this study an emerging interpretive qualitative investigation into students' own ideas was adopted. An interpretive constructivist inquiry paradigm can provide rich contextual information and provide insights into human behaviour as it uncovers emic views and avoids ambiguity (Akatugba & Wallace, 2009). The constructivist philosophy asserts that students should be able to experience what they learn in a direct way so that they will have time to think and make good reason of what they learn. Thus, this study aimed to elicit and understand students' meanings, claims, concerns, constructions, deconstructions and interpretations of their difficulties with representations of word equations from their own perspectives through the use of tasks on worksheets. Worksheets are effective learning materials that apply constructivist principles. They are defined as fundamental tools which contain required process steps and help students to configure knowledge while providing full engagement of whole class activities. Worksheets have been used in chemistry classrooms to assess achievement and permanency in learning (Celikler, 2010). They provide easy steps to follow and offer solutions to problems (Kirschner, Sweller, & Clark, 2006).

Cartoons, video animations, concept maps, and activity worksheets have been employed to help students build mental models.

# **DESIGN AND PROCEDURES**

The study, which followed a case study approach, involved thirty-one (31) 10<sup>th</sup> grade students. In the Ghanaian educational system these students are described as first year senior high school students. The crop of participants were a cosmopolitan group of males and females who had converged at this secondary school from all over the country and have learned about chemical equations in grades 8 and 9, called Junior Secondary in Ghana. Nevertheless, they were required to write a pre-test (Appendix A) so that their true entry level could be assessed. They were then given work sheets (Appendix B) to fill in missing spaces in word chemical equations. They were further required to describe and explain their answers and extend them in follow up interviews to place them within contexts of their beliefs about chemical reactions and word equations. The semi-structured focus interview schedule is presented as Appendix C. Final sets of issues based on constructivism, written works and responses would be linked to their high school chemistry contexts and references.



# DATA COLLECTION AND ANALYSIS

The text that follows is constructed from observations and interpretations of direct quotes of students' responses. Many of the identified issues which arose intersected and overlapped. Some responses were observed to go beyond the representation of chemical reactions. The post-task or activity sheets were used to probe and analyse students' constructions, deconstructions, and re-constructions. The analysis was integrative as it arose from the interactive process and its temporal structural context (Charmaz, 2000). No external influences were underpinned as Roth and Lucas (1997) purport. Following their examples, discourses were extracted from students' language. Thus, presentations of narratives and successive transformations were transparent while essential discourses were unearthed. Pseudonyms have been used for the participants. Narratives have been composed from the interviews as they give an in-depth view (Taber & Watts, Learners' explanations for chemical phenomena, 2000; Taber, Exploring students' ideas about a concept is through interviews. Roth and Hsu (2010) claim that from each interview, a researcher may learn not only from one person but the culture (school community) as a whole. Both general and particular observations are therefore equally concrete. The particular realises the possibilities that exist in the culture as a whole so that the general exists in the possibilities that individuals realise.

# FINDINGS AND DISCUSSIONS

Upon analysis of the bulk post-task data and interview, various misconceptions and themes emerged. Some of the misconceptions that were evident from the worksheets were:

- 1. Sulphate, sulphide and sulphite as descriptions for the product that can be formed from the reaction of sulphuric acid with another substance
- 2. Nitrate, nitrite and nitrile as representative of any anionic nitrogen atom in an anionic part of a substance
- 3. Wrong presentation of IUPAC nomenclature
- 4. Incorrect representations of coefficients, subscripts and superscripts Some of the emergent themes from the interview were:
- 1. Non-familiarity with word equations
- 2. Familiarity with formula/symbolic equations
- 3. Fear of writing the indescribable
- 4. Lack of confidence
- 5. Type of questions and responses required in school assessments and national examinations
- 6. Language of task and requirement
- 7. Cognitive ability
- 8. Underlying chemical principle
- 9. Diverse misconceptions
  - Documentary analysis

Although an overview of students' task/activity sheets showed that though their entry level about chemical equations was about the same for all of them, critical analysis showed a lot of differences. About 50% of the students did not assign any reasons to their answers. A higher proportion made wrong submissions with wrong names for anionic parts of binary compounds. For example, item 1 was:

Sulphuric acid + sodium hydroxide  $\rightarrow$  ...... + water.

Students supplied the name for the cationic part of the binary compound correctly by writing 'sodium'. However, the anionic part had names like 'sulphate', 'sulphide' and 'sulphite'. A similar observation was made for item 5, which was a reaction between calcium and nitric acid, to result in calcium nitrate. Products such as calcium nitrite and calcium nitrile were given by students. Majority of them who attempted to write the IUPAC names of missing products failed. The formation and names of binary compounds from given reactants are taught in Junior Secondary schools (grades 7 to 9) in Ghana. Thus, students are expected to have mastered the underlying principles that govern the formation of compounds- whether their common or IUPAC names are required.



There were a few odd observations. In the reaction of sulphuric acid with sodium hydroxide, a student wrote the product as sodium sulphide and assigned a reason that acids react with bases to produce salt and water, which was conceptually correct. However, he went on further to add that 'since a salt was produced, like sodium chloride (from sodium and chlorine or hydrochloric acid) this new salt would be called sodium sulphide'. This student has a wrong conception that all salts must have the ending –ide. A similar observation was made with item 2:

..... acid + Magnesium carbonate  $\rightarrow$  magnesium chloride + water + carbon dioxide

A student got the answer (hydrochloric) correct, but made an overgeneralisation in the reasoning part of his answer that 'an acid reacts with a base to produce water, carbon dioxide and a salt', which was non-scientific misconception. The student here is referring to magnesium carbonate (a salt) as a base, which is conceptually wrong. Wrong identification of substances could imply that students have conceptual misunderstanding, preconceived notions and factual misconceptions about matter and chemical phenomena. Possibly, general principles or rules were learned in earlier studies by rote and so application of 'forcefully' acquired knowledge could lead to wrong deductions with no conceptual basis. If such misconceptions are not challenged they could become entrenched.

# Emergent themes from interviews

#### Non familiarity with word equation/Familiarity with symbolic representations

Students said that they were not familiar with word equations. In the junior secondary schools they were told by teachers that chemical equations could be represented in that way but were cumbersome representations and so the symbolic representation was what was preferred by scientist. Thus, they did not practice nor were assessed on that kind of representation. Ellen, Akos and Martin commented on the challenges they faced with the word equation task. Our teacher said that writing chemical reactions like this is too long and so we must learn the symbols type (Ellen).

When you have to write the full name of a product it is more difficult because you know the formula but not how to read or write it in words. Just the element names would be fine or if not, ..... or something like sodium chloride is simple (Akos).

I am not familiar with these equations in word form. I prefer the symbols because it is easier to remember them. Those ones can be recalled with ease; it is shorter and simple (Martin).

# Fear of writing the indescribable (Psychological influence)

Martin's assertion is unfounded because before one can remember and write a symbol of an element (correctly) they would have to remember its full name. Perhaps writing the name out in full could pose challenges to some students; hence their preference for the symbolic form. This latter challenge with understanding the principle for naming complex species may be why some students wrote sulphite and sulphide for sulphate, and nitrite and nitrile for nitrate. A further probe into Martin's answers indicated that he was not aware of this kind of representation, though that kind of language 'sodium hydroxide plus hydrochloric acid' for example had been heard several times over. Having the equation written out in word form in full was hardly done in class. Majority of the attempted IUPAC presentations were incorrect. Working out the oxidation numbers of central species posed problems. Indeed some did not even know which element in the complex formula unit to choose as the central atom whose oxidation number should be worked out. This study was basically conceptual; nevertheless knowledge of these basic mathematical computations were expected of the grade 10 students. It was becoming apparent that they had preconceived, factual and conceptual misunderstandings. Cecelia intimated that she had not been taught in the past about central atoms. The term, entire idea and explanation were new to her as indicated.

Central atoms, I can imagine are in the centre of a compound but how does that happen? Which element must be selected or which one chooses to be the middle atom? Is there a rule ... pattern? (Cecelia)



Berthold, another student, was familiar with deducing the oxidation states of 'supposed' central atoms but sometimes he didn't know which one to choose.

The choice of that central atom is the problem for me. When I know it then I can deduce it. Sometimes I get confused which atom to attach the defined number to (Berthold).

Sally said that she didn't want to write anything that could make her look silly. It was not the prescribed representation.

I did not want to fill in the portions I didn't understand or write reasons I was not sure of. Such things make you look foolish. Besides, it is not the prescribed thing we learned from our school (Sally).

Solomonidou and Stavridou (2000) found out in a study that students have warped ideas about the characterisation of matter. Johnson (2000) also found that mistakes and communication problems between teachers and learners arise from semantic problems in the use of names and notions which arise from misinterpretation of the relationship between matter and its particles. This often leads to challenges that students have in ascribing the correct subscripts, superscripts and moles (or multiples) to chemical species. These challenges led to the emergence of 'fear of writing what one does not understand' and perhaps 'making a fool of one's self' on the students' activity sheets. About 37% of the worksheets had missing spaces and no reasons assigned to spaces that had been filled in at the end of the task period. The implication here is that students lacked confidence in completing their tasks. They had difficulties with language representations and multiple psychological influences. These driving forces were the result of their observed performance.

# Lack of confidence

Students admitted and exhibited lack of confidence, as was observed with Sally who didn't want to appear silly through her submissions. Most students did not appreciate the importance of word equations as they said that it was hardly used in everyday life. Most of their responses were similar to their answers about non-familiarity with word equations.

I have difficulty in expressing chemical equations in this form. I kept wondering whether it was a new thing WAEC (the national examination body) was about to introduce in our final 12<sup>th</sup> grade examination (Ohene).

I am more familiar with simple equations. I hope this 'new' type is not introduced into our examination (Betty A.) Back in our former school our teacher never accepted this kind of expression. I mean the word type. She said that

the symbols was what was common (Sally).

Sally was quite vocal in her group, and among other things added that:

Madam, we do not see such names on many household items. We see symbols instead.

As a follow up she was asked if she ever read through medicine leaflets or descriptions on medicine boxes and food packages, but she responded in the negative. It was pointed out to her that most of the active constituents/ ingredients of medicines and foods were in the word form and often had contraindications and their outcomes in word form as well. At this point the students were told that it was important that they appreciate the word form of representing chemical equations. Psychologically, the exercise was a good opportunity to foster change in students, as they were confronted with events that challenged their prior knowledge and confidence.

#### Disconnection with real life

Other group members (3 out of 5) expressed similar views as Sally, that, formula/symbolic expression were more common in everyday life than word representations. Thus, they did not find much use for the word equations. The implication here is that teachers have neglected this form of representation for chemical reactions, so that students no longer see its importance in everyday life.

In real life, at home and even in the lab we mostly see formula units, symbols, ..... (Joojo).

Writing these many words, though interesting, is not typical of the Ghanaian classrooms or environment; maybe in Europe or America. This is all new to me.... it looked foreign...alien. (Betty M.)

School and National modes of assessments



During interactions with the students in focus groups of six students each, it came to light that word equations were hardly taught or examined in class or national assessments. The students therefore had little exposure to word equations, their interpretations and presentations. In fact, in the column where reasons for choices had to be written, a few students interpreted the word equations into symbolic forms and worked out the missing parts- though some interpretations were wrong. Students said that the best impressions that they had about word representations were when they were required in examinations to write symbolic representations of specific unit compounds and vice versa, but never full word/sentence equations. According to Emma and Dora, sometimes making those interpretations were difficult enough. They could not imagine how they would have worked on full word equations. Most of the time I get the symbolic representations wrong because my teacher said that I had written a letter in

capital when it was meant to be small and vice versa. I also got the coefficients, subscripts and superscripts wrong most of the time. I think I didn't understand the combinations of the symbols too well. The proportions never matched most of the time (Emma).

Huh! A struggle! Sometimes you haver to join some of the words or names of the substances and other times you have to separate them. Sometimes too you simply get marked down because you have spelt the name of a substance wrongly by missing out on a letter or two. It was always tough and not any much easier now. I am cool with the symbols though (Dora).

These discourses explain why perhaps most students left the reason portion of their worksheets blank or translated the word equations into formula equations. It appears that human beings do not adapt quickly to change and even if they did, would revert to that which they first know and makes them comfortable. According to Gooding and Metz (2011), the brain files new data by making connections to existing information. If the new information does not fit the learner's established pattern of thinking, it is refashioned to fit the existing pattern. In this way, misconceptions are unknowingly created and reinforced as the learner files new data on faulty reasoning. To think that some of them did not want to 'disgrace' themselves by venturing into territories that they were not familiar with, says it all. Some did not want to make any attempt at configuring data. This also implies that teachers will have to avail to their students as many different ways by which assessments can be presented. If students get these exposures they will be able to fit in easily in all academic environments and put up their best. Often in the school or learning community, most teachers are set in the ways that test items and assessments are conducted. In this changing and technological world, there are many assessment options of which some are already available, while others could be customised from existent ones by innovative and creative teachers who want the best from and for their students. Thus, teachers must be up to the task. Developers of national assessments should also depart from their set ways which they hide behind and call 'standard' and set more minds-on innovative test items for assessing student. Diversification of test items in national and school examinations would expose students to possible assessments and get them to be more open-minded.

# IUPAC representation of chemical compounds

Wrong presentations of IUPAC names could be traced to students' inabilities to identify the central atoms and work out their oxidation numbers mathematically because of weak computational skills. A question was asked as to why an anion such as trioxonitrate was written without the oxidation number of the central atom. Some of the responses were:

I didn't know that in pure word equations you have to indicate the oxidation number. I mean figures or numbers. I worked it out mentally (Sally)

I could not figure out the one that should have the number because we had both oxygen and nitrogen. I thought it was oxygen but then, there were many of the oxygens to choose from (Bob).

# William also had this to say:

There were two atoms of the nitrogen (when I converted to formula form) so that made it difficult to choose a central atom to assign the oxidation number. The oxygen was also more than one (William)

William didn't have to attempt to convert to the formula for at all. He was simply to name the compound given in word form also in word form. Thus, he had to note the reacting elements and apply the principle required for the formation of binary compounds and name the resulting compound.



There was a mix up or application of unwarranted principles all in one. Note how he analyses that there were many oxygen and nitrogen atoms; like Bob. It is obvious that unchallenged misconceptions have already become entrenched.

In item 5, the IUPAC name for calcium nitrate was written as calcium trioxonitrate. Calcium trioxonitrate (VI) calcium nitrite and many other presentations. Again, a reason assigned was that the reaction was between and acid and a base. Students' understanding and identification of acids and bases were not well grounded and would require remediation to correct the identified factual misconception. In an earlier instance magnesium carbonate had been described as a base. In this other instance, calcium was also described as a base. At the time of this study, students had not been taught yet about elements in the S-block having the ability to form basic compounds. Thus, it couldn't be said that students were experiencing cognitive conflicts. The best reason that could be deduced from their responses could be that they were merely guessing and basing their answers on the familiar truth they knew about acids and bases- that these supposed acids and bases reacted to produce some of the products that they found on their worksheets. If they were able to identify an acid, then its corresponding reactant was adduced as a base and vice versa. This was an exhibition of preconceived notion as well as conceptual and factual misconception.

# Language and spelling

The names of most of the reacting substances and products formed that had to be supplied in the blank spaces were wrongly spelled. Students admitted to the fact that because they hardly wrote names of elements and compounds they were not familiar with their spellings. That was surprising for grade 10 students. Words like copper were spelt as 'cupper', and calcium as 'calsium', as pronounced in the Ghanaian dialect. The researcher has personally observed that a few students and many teachers pronounce those words as have been wrongly spelt by these students. Teacher-made misconceptions might have contributed to these students errors. When again, students in various groups were asked about some of these lapses, they responded that their text books basically contained chemical symbols and formula and not many word names of species and so they were not familiar with their spellings. Though their teachers mentioned the names sometimes, they almost always wrote them in symbolic form on their writing board. At other times their teachers said something like; 'when I add H<sub>2</sub>O to NaOH what observation will be made'? In such a case only symbols and not whole words were used by the teacher.

Our teacher often uses symbolic language such as 'come for your HCl with 50ml beakers'; 'add 2g of CuSO<sub>4</sub>' (John).

Damoah supported what John said by adding that he got confused a few times when the teacher used symbolic language as he was more aware of their word names.

Gina said that she preferred it if the teacher mentioned the real word names of chemical substances such as water, iron, sodium and sulphuric acid.

Sometimes I get confused with the symbolic or formula names, especially when they are stated in IUPAC form, like tetraoxosulphate (VI). I do not know if he means an ion, acid or a salt. Chemistry is really confusing and difficult (Gina).

# Instructional language

Many students wrote the reactant and product names in symbolic instead of word forms. Their reasons were that they did not understand the language because they almost always write out equations for chemical reactions in symbolic form. There was no reason for them not asking for clearer directives if they did not understand since the classroom climate did not appear as an authoritative or strict type. Ama and Kuu said that they understood the instruction given but thought that they could be presented in the short form used by scientist and that would be more acceptable.

I read the instruction that asked for the names, but I thought the short form with symbols was okay (Ama, Kuuku) Narteh did not read the instruction at all.

Oh, I did not see the instruction. I understood the work when I looked at it so I did some of them with symbols and some with words; whichever was easy and best (Narteh).

On the whole, they said that the instruction was clear but still did it their way as it was simpler that way. Students must learn to follow instructions as unrequited presentations could be unacceptable in some cases.



#### Cognitive ability

Judging from the participants' entry performance on the pre-test it could be discerned that most of these students performed only averagely, expressing many misconceptions. Prior to the task, many students expressed lack of confidence with,

'Can you give us the other type with symbols'? 'Can we have the exercise in the usual way?'

Errors identified in the diagnostic worksheet were similar to those which they had expressed earlier on in the pretest.

#### CONCLUSION

An interpretive study of the students' responses on their worksheets and in the focus interview revealed that grade 10 students in Ghana have a lot of misconceptions about word equations in particular and chemical equations in general, regardless the form of presentation. Remediation would be required to enable them overcome their misconceptions and to enhance their conceptions about chemical equations.

The findings go beyond enhancing students' skills in writing word equations to reveal some of their deep-seated difficulties and experiences. It was found that a few students had poor knowledge about compound formation. These findings reinforce the importance of exposing students to multiple and varied tasks that incorporate several cognitive and reflective activities and require an exhibition of such skills. Heavy reliance on algorithmic processes pose conceptual problems that eventually lead to the development of preconceived notions, conceptual misunderstandings and factual misconceptions. Some amount of vernacular misconceptions were also identified. It was interesting to note that a simple task could unearth and diagnose many concerns about students' challenges with chemical equations. It is evident that worksheets with constructivist undertones have the ability to improve students' conceptions about chemical changes and their representations and make all learners participate actively in class.

The apparent alien nature of word equations arose because of their assumed non-relation to practical life. Teachers must therefore make an effort to use word representations more frequently. Emphasis on questioning and justification of answers must be a daily norm during lessons as they will engage students in constant critical reflections. Again, teachers would have to promote and stimulate deep cognitive processes, situations and strategies. It is hoped that the findings of this study would form a platform for further studies into using basic simple diagnostic tools to unearth students' conceptual challenges in chemistry. Tools such as concept cartoons, concept maps, conceptual change texts, discussions webs, and inquiry approaches are suggested.

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	Appendix A: Pre-test diagnostic items
1.	Write the chemical symbols of the following elements:
	a. Lithium b. Iron c. Sulphur d. Oxygen e. Sodium
2.	Write the names of the following chemical symbols:
	a. Si b. Al c. Mg d. Cl e. Ca
3.	Write the names of these chemical compounds in full:
	a. NaCl b. CO <sub>2</sub> c. HCl d. MgO e. NaF
4.	Write the chemical formula of each of these chemical compound:
	a. Copper oxide b. Sodium carbonate c. Aluminium chloride d. Zinc chloride e. calcium sulphate
	Appendix B: Activity worksheet
1.	Sulphuric acid + sodium hydroxide → + water
	I think this is the answer because
2.	Iron + $\rightarrow$ iron chloride + copper
	I think this is the answer because
3.	$\dots$ + calcium carbonate $\rightarrow$ calcium chloride + water + carbon dioxide
	I think this is the answer because
4.	$Zinc + nitrogen \rightarrow \dots$
	I think this is the answer because
5.	Calcium + nitric acid $\rightarrow$ + hydrogen
	I think this is the answer because
	Appendix C: Semi-structured focus group interview guide
1.	Could you distinguish between sulphates, sulphites and sulphites? Kindly represent the differences
	diagrammatically.
2.	How familiar are you with word equations? How different are they from the symbolic form?
3.	How comfortable were you with the word equation activity sheet task? / Was the activity familiar?
4.	Which mode of representation would be preferred?

- 5. Has this study in any way exposed you to other kinds of presentations for chemical reactions? How?
- 6. What can you say about the difficulty level of the instruction given? Was it clear?
- 7. How difficult/easy was it to write the names of elements and compounds in word form? Explain further.
- 8. What benefits have you gained from the word equation activity?



# Using Video Recorded Corpus to Analyze Classroom Interactions in Elementary School Efl Classes

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This paper describes an interaction analysis study, which was carried out in a French Polynesian elementary school context. The corpus for the study was gathered via video recordings during an extensive educational project. This project aimed at collecting corpora on various school subjects from French Polynesian elementary schools between the years 2014-2017. The researchers used ATLAS.ti, a Computer Assisted Qualitative Data Analysis Software (CAQDAS) to analyse the classroom interactions collected from six elementary school teachers' EFL classes. The study attempted: a) to discover common teaching strategies and techniques the teachers employed; b) to understand the effects the teachers' actions on the learners, and c) to determine whether the teachers' teaching methodologies were in concordance with today's foreign language teaching approaches. The study used both comprehensive and descriptive data analysis methods. The transcribed data were examined by focusing on both verbal and nonverbal classroom interventions. The codes were generated by studying both classroom exchanges and video recordings. The analysed data were presented using interpretations of individual instances, examples, paradigms, and frequencies.

**Keywords**: interaction analysis, coding, qualitative research, EFL classroom, young learners, CAQDAS, interactionist perspective, SLA, socio-cultural theory, competency-based approaches, action-oriented approach, communicative language teaching

# **INTRODUCTION**

The present research took place in a French Polynesian elementary school context and reports on a classroombased interaction analysis study aimed at exploring teacher and learner exchanges. This research work uses a video-recorded corpus gathered via an extensive research project called 'Pratiques Educatives Enseignantes et Parentales en Polynésie' (PrEEPP-Teachers and Parents' Educational Practices in Polynesia) which was funded by the following organizations: Ministère des Outre-Mer (Ministry of Overseas France), Université de la Polynésie Française (The University of French Polynesia), Vice-rectorat de la Polynésie française, and the ESPE de l'Académie de Guadeloupe. The project was launched in 2014 and was carried out by a multidisciplinary and multi-institutional research team. The primary objective of this longitudinal research initiative was to constitute a representative body of an educational corpus from French Polynesian elementary school classrooms. To be precise, the initiative comprised of gathering large-scale data samples of different school subjects (i.e. Science, Mathematics, English, and Tahitian) across five French Polynesian archipelagos (Society Islands, Tuamotu Archipelago, Marquesas Islands, Gambier Islands, and Austral Islands). The geographical area that the project covered was as large as Europe and required the researchers to travel long distances (i.e. by boat and plane) to collect data. In 2015, some researchers from the University of French Polynesia integrated another local project into PrEEPP. The project was named after the state elementary school Maeha'a Nui, where the project was carried out. The primary objective of this scheme was to create a multilingual space within the school's premises. This project contained both research and non-research activities. The classroom corpus obtained via the Maeha'a Nui initiative was also integrated into the corpora of PrEEPP. The data collection procedures of PrEEPP initiative were completed in July 2017; however, the transcribing and analysing processes are still in progress. The researchers who participated in the study have started sharing the initial research results through conference communications and academic publications (e.g. see Ailincai,

Gabillon, Vernaudon, Paia, & Alì, 2016; Ailincai, Gabillon, Vernaudon, Saura, & Alì, 2016; Gabillon, Vernaudon, Marchal, Ailincai, & Paia, 2016; Gabillon, & Rodica, 2015a, 2015b, 2016; Gabillon, 2016).

The study described in this paper utilised six samples of video-recorded data gathered during the PrEEPP project. The researchers examined the classroom exchanges collected from six English as a foreign language (henceforth EFL) lessons. These samples were collected from different French Polynesian archipelagos. The study aimed to explore the teaching strategies and techniques the teachers employed in their EFL classes.

The present study based its theoretical stance on the sociocultural and interactionist perspectives in foreign language learning (henceforth L2). Sociocultural and interactionist theories see foreign language learning as happening through dialogic exchanges. These two viewpoints underline the importance of interaction in foreign language learning. From these perspectives, language learning takes place in interaction (in the process of interacting) rather than as a result of it. This classroom corpus-based interaction analysis study utilised both qualitative and descriptive data analysis methods. The researchers used ATLAS.ti, a Computer Assisted Qualitative Data Analysis Software (CAQDAS) to analyse the corpus, and the results were presented by using extracts, comments and histograms.

# LITERATURE REVIEW AND THEORETICAL STANCE

SLA is a multi-disciplinary field which makes use of insights and research paradigms from other domains such as linguistics, education, sociology, psycholinguistics, sociolinguistics and psychology (Ellis & Barkhuizen, 2005). It is commonly stated that the issues concerning L2 learning cannot be fully understood from a single perspective (Tarone, 2000). L2 learning involves a multitude of complex and interacting incidents which cannot be captured and understood from a narrow viewpoint. This study views L2 learning as a situated phenomenon which is influenced by both micro and macro social contexts and "…embedded in these contexts are the multiple relations of inequitable power in which language learners participate." (Ellis & Barkhuizen, p. 278, 2005).

This research work based its standpoints on sociocultural (SC) (Vygotsky, 1978, Lantolf, 1994, 2006, 2009) and interactionist perspectives (Swain, 2000). These two viewpoints seem to capture the complexity of foreign language learning (henceforth L2) both in instructional and natural settings. From these viewpoints, language learning is regarded as occurring in interaction (in the process of interacting) rather than as a result of it (Lantolf 2002). Although Vygotsky's works stressed the role of socially mediated interaction in learning, his standpoints were different from today's interactionist perspectives in language learning. The sociocultural and interactionist traditions used different research paradigms and produced different scientific terminology. However, these two approaches share remarkable similarities, as regards the principles which characterize them. In SLA literature, these two standpoints are often referred to under the name of 'socio-interactionist approach' (e.g. Mondada & Doehler, 2004; Swain, 2000; van Compernolle, 2010). These two perspectives are complementarity to one another, and they underline the importance of scaffolding (teacher & peer) and face-to-face interaction in L2 learning (Vygotsky, 1978; Lantolf, 1994, 2006, 2009; Swain, 2000). They both view L2 learning as a social phenomenon occurring with the involvement of diverse social actors and artefacts (Lantolf, 2000). In this section, the researchers will try to highlight the key terminology used in these two perspectives.

For the last two decades, there has been an exponential increase in the interest in SC theories in L2 learning. This theory suggests that human learning is primarily a social process. Foreign language specialists who adopt an SC framework consider language learning as a social activity in which language operates as a tool for thought (Lantolf, 2002, 2006; Mitchell & Myles, 2004). L2 learning from this viewpoint is seen as an activity which happens both in social (interpersonal—social & cognitive) and personal planes (intrapersonal—individual & cognitive) (Vygotsky, 1978). The sociocultural perspective sees cognitive development and knowledge construction as a collaborative social event, which uses social artefacts. According to this view, optimal cognitive development depends upon socially mediated interaction. From this perspective, language learning is seen as a situated activity that occurs first in a social context through interaction with others and then within the individual through cognitive processes (Lantolf, 2000, 2002, 2006; Mondada & Doehler, 2004; Swain, 2000).



The key terms which are associated to SC philosophies are: 'mediation', 'Zone of Proximal Development (ZPD)', 'scaffolding', 'Activity', and 'Social Artefacts'. The term mediation was introduced to literature by Vygotsky (1978) and refers to interpersonal interactions that provide guidance (help) in children's cognitive development and knowledge construction. The ZPD concept is linked with mediation, and it constitutes the central element of the SC theory. ZPD explains how learning takes place in a social context. It refers to the difference between what a learner is capable of doing without guidance and what s/he is capable of doing with guidance (Vygotsky, 1978). The concept has been interpreted and applied to various educational contexts (see Figure 1, Gabillon & Ailincai, 2006). According to the SC perspective, knowledge is co-constructed with others (other-regulated) in social planes, and it is appropriated (self-regulated, internalized) in personal-planes. In this social setting, language is used as a means by the individual to regulate his/her cognitive activities, that is, language is used as a "...tool for thought..." and "...a tool for learning..." (Lantolf, 2002, 2006; Mitchell & Myles, 2004). The term scaffolding was introduced to the sociocultural literature through the works of Jerome Brunner and his colleagues (Brunner et al., 1976). Later the concept was elaborated by Bruner, and the concept now is associated with him (Brunner, 1978). This term was defined as the process of supportive dialogue, which draws the learners/peers' attention to the main features of learning (Brunner et al., 1976). According to Vygotsky (1978) the social activity, which involves the use of social artefacts, contributes to the child's cognitive development. The role of social artefacts in the child's potential cognitive development is explained by Vygotsky's ZPD concept (1979). The SC theory considers all human-made material and objects as artefacts. Swain, Kinnear and Steinman (2011) claim that all artefacts, such as symbolic (e.g. language) and material (e.g. books) can become tools for mediation. Swain et al. (2011) assert that all sort of human mental activity is mediated through individuals' interactions with these social artefacts (symbolic and material world) around them. The role of artefacts in mediating learning is explained and theorised in the activity theory. In SC theory, activity is described as a purposeful social interaction between actors and "artefacts" (the world and its objects). Aleksei Leontiev's Activity Theory expanded and updated many of the concepts introduced by Vygotsky (Leontiev, 1974, 1978; Engeström, 1987).



Figure 1. A Schematic representation of the notion of Zone of Proximal Development (ZPD) in an educational context (Gabillon & Ailincai, 2016).

The key terms used in the interactionist approach are: 'comprehensible input', 'interaction hypothesis', 'collaborative interaction/dialogue', 'negotiation of meaning', 'output', 'noticing' 'hypothesis testing' 'modified output', and 'intake'. Interactionist perspective to L2 learning takes its inspiration from Krashen's 'input hypothesis' (Krashen 1979, 1983) which explained that the primary condition for language learning is to understand messages (input). He named this phenomenon as 'comprehensible input'. In his input hypothesis, he maintained that in order for learners to progress, the level of the input should be 'i +1' ('i' represents the learner's language level, and +1 is the new input, which should be a little higher than the learners' actual level).



L2 Researcher Michael Long insisted that the interactions that take place in L2 learning contexts should not be seen as "...one-directional source of target language input..." (Mitchell & Myles, p. 160, 2004). Long took Krashen's ideas further by proposing that attention should be paid to the interactions which occur between learners and proposed the 'interaction hypothesis' (Long, 1981, 1983). Long's interaction hypothesis (1981, 1983) claimed that "...L2 acquisition is facilitated when a communication problem arises that causes learners to try to resolve it ...." (Ellis, 2012, p. 23). This process of modification and restructuring during interactions happening between peers is named as 'negotiation of meaning' (Long, 1981,1983). Swain referred to this process as 'collaborative dialogue'. According to her, collaborative dialogue "...is knowledge-building dialogue..." (Swain, 2000, p. 97) and modifications that are made within these collaborative interactions resolve communication difficulties (Ellis, 1991). Ellis and Barkhuizen defined the negotiation of meaning as "... the conversational exchanges that arise when interlocutors seek to prevent a communicative impasse occurring or to remedy an actual impasse that has arisen...) (Ellis & Barkhuizen, 2005, pp.166-167). Swain maintained that negotiation of meaning process aims to increase the comprehensibility of the interaction and meaning-making (Swain, 1993, 2000). She explained that during the negotiation process the learners use strategies such as repeating, rephrasing, and translating etc. that lead to the comprehension of the input. Nonetheless, she claimed that comprehension is not the sufficient condition for L2 learning and argued that there is a direct link between language use and language learning (Mitchell & Myles, 2004). Swain maintained that interaction provides not only comprehensible input but also the opportunity to use the language (output). She put forward a set of claims explaining that "...output pushes learners to process language more deeply..." (Swain, 2000, p.99). She also maintained that 'output' should be seen both as part of a communicative and cognitive activity. She formulated this claim as 'output hypothesis' (Swain, 1985, 1993; Swain & Lapkin, 1995). Swain maintained that 'output' requires more cognitive effort than 'input' and it pushes the learners to progress. She added that during the output learners may *notice* the gap between their interlanguage and the target language and may look for help to fill in this gap (help from peers or teachers-ZPD). This viewpoint sustains that learners apply a series of 'hypothesis testing' procedures to test the accuracy of their interlanguage. This process helps them progress in their learning through the use of trial-error strategies and modify their input (intake). Having gone through this activity learners become aware of their problems, predict their needs, set goals, monitor their language performance, and to evaluate their success (Swain, Kinnear, & Steinman, 2011, 2015).

The principles of the aforementioned theories constitute the foundation of the current L2 teaching approaches. These L2 approaches are grouped under the competency-based language teaching (CBLT). The commonly known L2 teaching methodologies which fall into this category are: a) Action-based/oriented approach (AOA), b) Communicative Language Teaching (CBLT), c) Task-based language teaching (TBLT), d) Project-based approach, e) Content and Language Integrated Learning (CLIL) (Adler & Milne, 1997; Lier, 2007; Council of Europe, 2001, Richards & Rodgers, 2014). These L2 approaches respond to the key expectations defined in the Common European Framework of reference for languages, in other relevant Council of Europe publications (Council of Europe, 2001; European Commission, 1995, 2003, 2008; Eurydice Network, 2006) and the official texts published by the French Ministry of education. As the name indicates, these competency-based approaches aim to build skills and competencies that learners can transfer and use in other similar contexts. They all emphasize the primacy of face-to-face interaction in language learning and activities which focus on the successful functioning in society (i.e. to be able to use the language communicatively in real-life situations etc.).

This research study will also use the principles conveyed through the activity framework designed by Gabillon and Ailincai (2015b, 2016). The framework was designed through applying the ideas expressed in the sociocultural and interactionist perspectives. The aim of this framework was to provide teachers with some guidance in the conception of their L2 activities. (Gabillon & Ailincai, 2015b, 2016). The principles of this framework are presented in Table 1.



Table 1: Socially-mediated activity design for L2 learning (Gabillon & Ailincai, 2015b)

Socially Mediated Activity (SM	MA) Framework
Collective mediation	SMA views learning as an active and constructive process where
	learners collectively construct new information through collaborative
	interaction and joint attention
Joint attention	SMA uses goal-directed activities which require learners to work
	together to fulfill tasks
<b>Collaborative interaction</b>	SMA encourages natural face-to-face pair/group interactions. This
	type of collaborative interaction uses language as a means to
	exchange information and construct knowledge
Social artefacts & gestures	SMA enables the use of artefacts and gestures to mediate learning
Experiential learning	SMA provides learners with hands-on activities to enable learning
	through direct experience (e.g. laboratory experience, gardening etc.)
Naturalistic learning	SMA allows learning to take place in naturalistic learning settings
environment	(e.g. laboratory experiments in labs, gardening in the garden etc.)
Active involvement	SMA uses activities which necessitate each individual learner's
	active participation to complete tasks

#### CONTEXT

French Polynesia is an 'Overseas Territory' of France (COM-- collectivités d'outre-mer) and the primary and secondary education implement the French National Curriculum. French Polynesia is a multilingual society where several local languages are used as home languages. Nevertheless, French is the only official language and the medium of school instruction. There are a hundred and seventy-two elementary schools scattered over five archipelagos, and because of their remoteness, these schools are not easy to coordinate (Gabillon & Ailincai, 2015a). In French Polynesia, elementary school teachers are generalist teachers, and they do not receive specialised primary level foreign language teacher education as part of their qualification (Gabillon & Ailincai, 2015a).

Between the years 2005-2017, several educational research projects were funded by both the French government and local authorities. These projects addressed to issues concerning plurilingualism and school instruction and investigated the influence of bilingualism (French and the Tahitian language) on Polynesian children's school learning. These research activities concerning the importance of plurilingualism have provided the local educational authorities with useful information on Polynesian children's academic, cognitive, social and conational skills in a multilingual elementary school setting (Gabillon & Ailincai, 2015a).

During the PrEEPP project (2014-2017), more than 80 video-recorded data were obtained (from different subject lessons and parent interviews). From the EFL classes, all in all, 16 video-recorded lessons were collected. These recordings were gathered from the following archipelagos: Society Islands (6 lessons), Tuamotu Archipelago (3 EFL lessons), Marquesas Islands (3 lessons), Gambier islands (1 EFL lesson), and Austral islands (3 lessons). The corpora gathered during the PrEEPP initiative were vast, and the researchers have not yet completed transcribing and analysing processes.

# **RESEARCH METHODOLOGY**

This research work is an interaction analysis study which used both comprehensive and descriptive statistics as analysis methods. The videotaped classroom corpus was transcribed, and the transcribed data were analysed by using a qualitative data analysis software ATLAS.ti. The results obtained were presented by using qualitative methods (e.g. extracts, comments etc.) and descriptive statistics (e.g. histograms).

The study aimed to: a) to discover common teaching strategies and techniques the teachers employed; b) to understand the influence of the teachers' actions on their learners, and c) to determine whether the teachers' teaching methodologies were in concordance with today's foreign language teaching approaches.



#### **Participants & Data Collection**

The present study focuses on EFL learning in this plurilingual French Polynesian context. The subjects involved in this study were four female and two male elementary school teachers with ages ranging from 32 to 45. These teachers had from 8 to 20 years of teaching experience. The video-recorded data contained 121 elementary school students' classroom corpora. The number of students in each class varied from 21 to 27 students. All of the participants were elementary school students between 7 to 11years of age and 1 to 3 years of English language learning experience.

# **Data Collection Method**

L2 classes involve a variety of actions, and face-to-face exchanges and such incidents could not be easily captured and understood. Classroom-based research requires capturing linguistic, extra-linguistic and social aspects of classroom discourse (Dufon, 2002; Swann, 2001). This research work used video recording as a research instrument. When used as a research instrument video-recording provides researchers with a replicate of actual classroom happenings. Some of the advantages of video-recordings can be listed as follows: A) They capture both linguistic and social cues such as the language, turn taking, voice, intonation, and extra-linguistic elements such as gestures, body language and so forth. B) They provide permanent data which could repeatedly be replayed and studied. C) They help to distinguish different speakers. D) They provide visual information which contributes to clarifying verbal messages. E) They may help to identify observable emotions such as enjoyment, boredom, excitement, anger and so forth. F) They provide contextual information concerning the physical setting such as space, facilities, classroom arrangements, teacher movements, posture and so forth. G) They provide researchers with the complete account of the classroom exchanges (i.e. every word uttered and every action made is recorded).

### **Analysis Method**

This study used interaction analysis method to analyse the video-recorded corpus. Interaction analysis is a widely-used method in SLA and Applied Linguistics research. This research paradigm enables researchers to capture and analyse a multitude of elements occurring during human interactions (both verbal and non-verbal). The analysis procedures entailed transcribing, coding, linking, comparing, grouping and interpreting.

In this study, the following procedures were followed. First, the videotaped corpus was transcribed paying attention to both verbal and non-verbal elements in the corpus samples. The transcriptions were made manually using a transcription notation adapted from the notation system offered by Jefferson (2004) (See Table 2). The transcriptions were then imported to ATLAS.ti software for analysis. The initial coding was performed through the use of open codes. The researchers studied each transcription closely and labelled the exchanges according to the functions they performed in the exchange. Then they labelled the codes mostly using the terms from SLA and Applied Linguistics literature. After the identification and labelling of the concepts, related ideas were linked and grouped. The researchers continued studying, linking and comparing processes until they formed consistent concept groups. Finally, the labelled concepts were reintegrated into higher level categories.

Symbol	Name	Use
[ italic text]	Square brackets	Indicates the start and end points of overlapping speech.
((italic text ))	Double Parentheses	Indicates comments, translation, or annotation of non-verbal activity.
(italic <i>text</i> )	Parentheses	Indicates speech which is unclear or in doubt in the transcript.
	Ellipsis	Short pause.
0	Degree symbol	Indicates whisper or reduced volume speech.

Table 2: Transcription notation used in the study (adapted from Jefferson, 2004)

ALL CAPS	Capitalized text	Indicates shouted or increased volume speech.			
underline	Underlined text	Indicates the speaker is emphasizing or stressing the speech.			
:::	Colon(s)	Indicates prolongation of an utterance/ indicates a stretched sound.			
(hhh)	Parentheses	Indicates laughter in the conversation/speech.			
	Dash	Indicates a break within a word.			
=	Equal Sign	Indicates the break and subsequent continuation of a single interrupted utterance.			

The insights gained through inductive analysis and comparisons were presented in the form of comments. The SLA and FLL research studies were also contributed to the shaping of the interpretations and comments. The researchers utilized extracts of significant episodes to illustrate vivid examples to support explanations. In addition to qualitative comments and inductive interpretations, a summary of results was presented using frequencies (e.g. histograms).

# RESULTS

This section will present the results obtained through comprehensive and inductive analysis procedures. These results concerning the categories and the summary of results will be presented using of comments, tables, histograms, and extracts.

# Categories

After intensive comprehensive and inductive analysis processes (e.g. repeated viewing of the video-recorded material, coding, linking, comparing, grouping etc.), the researchers grouped all exchanges under two major categories as '*Teacher*' and '*Learners*'. Other higher-level categories were grouped under these two main groups. The summary of results used these groups to explain the outcome of this research.

The SLA and Applied Linguistic terms were used to name the meaning and function of the teachers' and learners' utterances. These higher-level categories were formed through applying the qualitative analysis processes used in grounded theory, that is, the concepts were labelled, and then the categories were developed when the researchers discovered concepts on the same phenomenon (not all concepts became groups). This means that when a concept was named it was compared with other concepts for similarities and differences. Only the most grounded, pertinent, and thickest, categories became higher level groups.

The teachers' classroom exchanges were grouped into five higher-level categories according to their functions. These categories were named as T-Scaffolding strategies, T-Corrective feedback strategies, T-Problems related to L2 competence, T-Use of the Mother Tongue (hereafter L1), and T-Activity Types. Other lower level concepts which represented similar activities were assembled under these headings. Table 3 presents the categories and sub-categories grouped under the category '*Teacher*' (see Table 3).

T-Scaffolding	T-Corrective	e	T-Proble	ms		T-Use	of	T-Activity	Types	
Strategies	feedback stra	ategies	related	to	L2	L1				
			competer	nce						
Checking	Direct correc	ction	Unattend	led		Use of	L1	Whole class	ss	
understanding			problem			(Teache	er)	(non-comm	nunicative	
								activity)		
Use of gesture and	Guided co	orrection	inauthen	tic				Group/pair	work	
artefacts	Recast		language	use				(non-	or	quasi-

# Table 3: The category 'Teacher'



				communicative activity)
Asking	for	Misleading	Incorrect	Group/pair work
repetition		correction	language use	(communicative or real-life
				activity)
Asking	for			
confirmation				
Asking	for			
information				
Giving explana	ation			

Concerning the students, the categories that emerged through the analysis process indicated three large categories: L-Active Involvement, L-Passive Involvement and L-Use of L1 (see Table 4). Other sub-groups which are linked with these groups were also collected under these three higher level abstractions.

Table 4: The category 'Learners'

L-Active Learner Involvement	L-Passive learner involvement	L-Use of L1
Asking for confirmation /clarification	Reciting/performing	Use of L1
Asking for information	Repeating	
Disagreeing		
Free language use		
Giving explanation		
Peer feedback		

### **Summary of Results**

1) The number of exchanges and duration of each lesson

In this study, the analysed classroom exchanges were mainly in the form of simple repetitions or short questionanswer type utterances. Only very few of the exchanges were learner initiated. This type of classroom exchange is known as *Initiation Response Feedback* (IRF).

The use of IRF patterns and whether they hinder or promote L2 development has been a subject of debate among SLA and FLL scholars. Many SLA researchers have argued that teachers adapt their classroom interactions according to the focus of the lesson. Some researchers maintained that IRF structure could be useful when the focus is on the 'accuracy'. However, many SLA studies have reported that the permanent use of such a teaching structure is unlikely to promote the communicative competence needed in real-life communications (Ellis, 2012).

These teaching patterns are easy to use and have control over the students because they proceed in an orderly manner and the teacher is the 'initiator' and 'knower'. This style of teaching restricts learner participation and does not allow trial-error possibilities. IRF is considered to be an unproductive instructional format that limits opportunities for L2 development, when becomes a routine classroom procedure (Ellis, 2012; Van Lier, 1991, 2008). IRF exchanges are not usual in communicative or task-based activities, which are primarily designed to promote face-to-face learner exchanges.

The transcribed corpus and video recordings illustrated that the language exchanges used in these six teachers' classrooms were short utterances through which the teachers initiated an exchange, asked a student to respond and then they followed up. Figure 2 presents the total number of exchanges occurred in each teacher's lessons and the duration of each lessons.




Figure 2: The number of exchanges and duration per lesson (T=Teacher)

*Extract1* illustrates a series of repetition drill exchanges between *Teacher1* (T1) and the students. Because of space constraints the researchers included only part of these ubiquitous whole-class exchanges. Extract 2 is also a good example to characterise an IRF exchange. In this particular example, T1 attempts to elicit the correct language form through the use of an IRF pattern. Although the teacher attempts to involve other students in the corrective feedback procedures she fails to give a chance to the student to self-correct and she simply asks the student to repeat the correct language form (see Extracts 1 & 2).

P Extract 1	P Extract 2
(T=Teacher, Ss=Learners)	(T=Teacher, Ss=Learners S=Student)
T : Ball!	T: Is right?
Ss: Ball! [ Ball]	Ss: Yes
T: Bicycle!	T: The ball is in? ((She uses a gesture to indicate
Ss: Bicycle! [Bicycle]	the position 'in'))
T: KITE!	Ss: On!
Ss: Kite! [KITE]	T: The ball is on! Stevens? Repeat!
T: Doll!	S1: The ball is on the table!
	T: Is good: ::::!
	T: ((The teacher shows another picture.))

## 2) The Use of L1 & L2 language exposure

The issue of L1 use in L2 language classrooms has long been a subject of debate in the L2 literature. Many scholars (although many of them agreed on the legitimacy of L1 in L2 classrooms) claimed that successful language learning requires extensive L2 input. (Chaudron, 1988; Ellis 2012; Turnbull 2001). Ellis (2012) explained that L2 learning is a slow and demanding process and unless learners receive L2 exposure, they cannot acquire it. Turnbull and Arnett's (2002) in their literature review about the L1 use explained that that in some learning situations L1 use can help teachers and peers to scaffold learning and to negotiate meaning. They also maintained that during collaborative tasks the learners' use of L1 facilitates interpersonal interaction and increase their efficiency.

Figure 3 illustrates the frequencies of L1 utilised both by the teachers and the students. The analysis of the corpus from six participant teachers indicated that four out of six teachers sustained L2 use throughout their

lessons except for some short exchanges to fix misunderstandings, to give instructions or explanations, or to make a joke and so forth.



Figure 3: The use of L1 (teacher & learners) and the teacher's encouragement to use L2 (T=Teacher, E=Exchanges)

The analysis of the classroom exchanges showed that T1 and *Teacher5* (T5) both used L1 extensively during their lessons. However, T1 used L1 more frequently than the other five teachers. In many occasions the teacher's use of L1 did not seem to be necessary and the exchanges in L1 were particularly very lengthy (see Extracts 4 and 5).

® Extract 3	P Extract 4
(T=Teacher, Ss=Learners S=Student)	(T=Teacher, Ss=Learners S=Student)
: Sac, bag!	Bien! Poupée ((Well! Doll)), a doll! A vous! ((You!))
Sac ((bag)), the bag. Tout le monde est d'accord ?	: A doll!
((Does everyone agree?)) ((The teacher writes the	On passera à la prononciation ensuite. ((We will then
words in French and in English.))	proceed to pronunciation.))
: Oui! ((Yes !))	Alors ! Yo ::-::yo? Alors ça pourrait être quoi ? Je ne
Tout le monde répète ((Eveybody repeats)) : bag !	fais pas le niveau difficile normalement le matin.
: Bag!	((Well! Yo::-:Yo ! What could it be? Normally, I do
Autre chose peut- être! ((Perhaps another thing!))	not do the difficult level in the morning.))
Kahea? ((The teacher points to Kahea))	
: °°° (Unclear speech)	Allez ! On fait un petit rappel, ce ne seront pas long,
Plus fort ma puce. ((Louder my heart))	on va voir si vous vous en rappelez. ((Come on, we
: Table	(will) do a little revision, it will not be long, we'll see
: Table! Est ce que c'est bon? (('Table' ! Is it	if you remember.))
correct?))	C'était une des premières séances de l'année. ((It was
: Oui! ((Yes!))	one of the first sessions of the year.))
some students keep their hands up. They are waiting	En français Yo-yo en anglais yo-yo. ((In French, it is
for the The teacher to ask them to speak.))	yo-yo. In English, it is yo-yo)) ((The teacher writes
Répétez ! table! ((Repeat ! 'table'))	the words on the board.))
: Table!	En français puzzle en anglais puzzle ((In French, it is
	puzzle. In English, it is puzzle))
	: En français robot en anglais robot. ((In French, it is
	robot. In English, it is robot))
	: En français table en anglais table ! ((In French, it is
	table. In English, it is table))



T1's lesson was based on translating language items from English to French or vice versa. However, T5 used L1 to give complex instructions, to explain the purpose of the task, to check understanding, to socialize with her students and to manage the class (see Extracts 5 & 6).

'=Teacher, Ss=Learners S=Student)       '=Teacher, Ss=Learners S=Student)         You will write the message to them. So, let's try today.       So Who is ready to write? Who is ready to write ((She mimes meaning that they should write.))         Qui a compris là ce que je viens de dire?       ((Who has Qui est prêt? Qui est prêt, déjà ? ((Some students rai	
You will write the message to them. So, let's try today.So Who is ready to write? Who is ready to write ((She mimes meaning that they should write.))Qui a compris là ce que je viens de dire? ((Who hasQui est prêt? Qui est prêt, déjà ? ((Some students rai	
understood what I've just said?))their hands.)) Are you sure?(some): En fait on va écrire une lettre. ((In fact, we will write a letter.))Sûr? Sûr? [Unclear and overlapping speech.] Moi!° Moi!° [Me! Me!]By computer.Wait a minuteprêts ? (ready?) Can you Ye Can you give me some example?`	e? ise es?
letter.)) (some): Cochone ((Pig))?	
By computer![ S: J'ai déjà vue. ((I have already (hhh) aii aie non! seen it.))] So	
(some): On va écrire un mail. ((We will write an e- (some): On va regarder dans le dictionnaire! ((We mail.)) will look it up in a dictionary.))	Ve
Can you repeat (Canny)? Listen!	
Calyssa, repeat, please ?	
On va leur envoyer un mail. ((We will send them an email.))	
On va leur envoyer un mail. ((We will send them an email.))	

Regarding the students, the corpus indicated that in T5 and T6's classes the learners used L1 more that the students in other teachers' classes (except T5s class) (see Figure 3). In T6's lesson, the students were engaged in a group activity (the students were seven-year-old and most of the time the teacher was not present with the students). The close analysis of the learner interactions illustrated that these students were 'at task' 100% of the time and used L1 primarily to negotiate meaning, to give explanations to their classmates, to show disapproval, to imitate the teacher and so forth. All the activities they performed related to the task that they were involved in (see Extract 7). The students in T5's classroom, on the other hand, used L1 to show understanding, to ask for clarifications and so forth. However, they were not always 'at task' (see Extract 6).

## 🥯 Extract 7

(S=Student)

S4 : Sais pas comment on dit les grands nombres. ((Does not know how we say big numbers))

- S6 : (Addresses S1 by calling out her name.)
- S1 : Sixteen?

S6 : Yes, very good ((Imitates his teacher.)). ((We do not see the teacher but we hear her giggles.))

- S2 : Elle a dit 'six'...((She said six...))
- S6 : Teen::: ((He confirms that she (S1) said sixteen and not six.))
- S2 : Teen? ((Asking for confirmation.))
- S6 : (Nods his head in agreement.)
- Ss: ... [Unclear overlapping speech]

S6 : Tiens! ((Take!)) (Passes the box of flashcards to S1.)

3) Scaffolding strategies used by the teachers

The results obtained illustrated that the teachers used main teaching and scaffolding strategies which are commonly used by L2 teachers. The researchers grouped these strategies under the following labels: 'Asking for clarification', 'asking for confirmation', 'asking for repetition', 'giving explanation', 'asking for information' and use of artefacts'. 'Asking for clarification' refers to a strategy that teacher employs to help learners make their meaning clear. The teacher may also use this strategy to check learners' understanding. The primary function of this strategy is to make sure that the learners have understood the phenomenon in question.

When used efficiently 'asking for clarification' strategy can promote active cognitive learner engagement and L2 development. The analysis indicated that this strategy was not very frequently used by the teachers (see Figure 4).



Figure 4: Scaffolding strategies used by the teachers (T=Teacher)

In this study 'asking for confirmation' refers to the teacher's request for confirmation to make sure that the learner means what s/he intends to say. However, in some cases this strategy may be used as a recast which is employed to direct the learner's attention to a mistake, and by asking for confirmation the teacher gives him/her the opportunity to correct himself/herself. These two functions are interrelated and sometimes it is difficult to separate one from the other. In this study, the researchers used the term 'asking for confirmation' to refer to both of these functions. The analysis revealed that this strategy was primarily used as a recast to indicate learners that they committed an error.

In L2 classrooms, functions of these teaching strategies may differ depending on the requirements of the situation and the intended purposes. For instance, 'asking for repetition' may take divers forms varying such as rote repetitions of words (see Extract 1 above), clarification requests to resolve misunderstandings, or asking for a repetition to hear well. In this research study the researchers defined 'asking for repetition' as a rote learning technique which is performed mechanically. The corpus illustrated that some teachers employed this strategy frequently (e.g. T1 and T3).

'Giving explanations' is the most commonly used and known teaching strategy. However, when it is used frequently and interminably this technique can lead to minimising useful Student Talking Time (STT). Some examples from T1 and T2's classrooms illustrated frequent and lengthy explanations, many of which could have been avoided through the use of examples, contextualising and the use of gestures or artefacts.

The category labelled as 'asking for information' means any form of request to obtain information or response from the students. This can be in the form of a simple question, elicitation, or brainstorming that necessitates a



response from the learner. In the lessons the researchers examined, this strategy was predominantly used the get responses from the students. These, responses were predominantly in the form of short or on-word answers (T1 and T2).

The strategy 'use of gestures/artefacts' was exploited by all of the teachers observed. Mostly the teachers used this strategy to teach vocabulary items through the employment of flash-cards, PowerPoint slides, pictures, and objects. The researchers did not observe other creative use of artefacts and objects. Activities such as real-life tasks, the use of TPR, or artefacts and gestures to supplement instructions etc. were not observed in the analysed lessons.

The results also indicated that the learners were not encouraged to make use of artefacts and gestures to help them communicate, either. The learners were mainly encouraged to respond to the teacher verbally and non-verbal aspect of expression was very limited. Longitudinal SLA research studies have shown that young learners manifest a silent period at early stages of their L2 development (Ellis 2012).

Many applied linguistic researchers, recommend a variety of comprehension based Total Physical Response activities [TPR—Demonstration based L2 teaching method first introduced to the Applied Linguistics literature by James Asher (1969)] that encourage learner participation through the use of non-verbal response (through, demonstrating, drawing, acting, showing pictures etc.). Thus, supplementing verbal exchanges with non-verbal activities, through which the learners can participate, is highly recommended.

## 4) Corrective feedback strategies used by the teachers

Corrective feedback, that is, how teachers 'repair' their students' language errors, has been one of the most researched SLA topics (Ellis, 2009). Corrective feedback is an integral part of L2 learning and the methods teachers use to engage their students in this process influence the learners' L2 developments. How and how much should error correction be done, when should errors be corrected (immediately or delayed), who should do the correcting (teacher or students) have been the subjects of debates in SLA research (e.g. Ellis, 2009; Lyster & Saito, 2010; Russell, 2009 etc.). SLA research has maintained that repair (error-correction) can be used as a learning tool if it is not over done and when it is done efficiently. Recast (guided repair), that draws the learner's attention to a faulty language output, is viewed as an effective strategy to help learners notice the gap between their language production and the target language form. This strategy is known as an implicit error correction technique, through which the teacher encourages the learner to self-repair. Direct correction technique, which was widely used in former L2 methodologies (Audio-lingual method—based on the behaviouristic approach) is no longer recommended by current L2 teaching pedagogies. During corrective feedback, it is also important that the purpose of the correction is understood by the learner (that the correction should not be misleading).

The results the researchers obtained through the analysis of the video-recordings and the transcriptions indicated that the participant teachers had the tendencies to use guided repair strategy (see Figure 5). However, on some occasions the teachers did not manage to make their purpose clear to their students. On some other occasions, the repair strategy the teachers employed was not clear because they were not sure about what exactly the error was or how to repair the error (which resulted in misleading corrections).





## 5) Problems related to the teachers' L2 competence

As mentioned earlier, in French Polynesia, elementary school teachers are generalist teachers and they do not receive specialised primary level foreign language teacher education as part of their qualification. However, all elementary school teachers are expected to have competence level B2 (upper-intermediate level that corresponds to the reference provided by the Common European Framework of Reference for Languages--CEFRL). The results obtained from this study indicated that the teachers had some L2 difficulties (see Extracts 8 & 9).

P Extract 8	
(T=Teacher)	

F: Look! Now:: close your eyes /aisəs/.....Close your eyes! /aisəs/ ((She mispronounces the word 'eyes'.)) ((Children close their eyes.))

[: Close your eyes! /aisəs/ Hei! ((She mispronounces the word 'eyes'. She looks around to check.))

[: Frederic et Faratetama ((Frederic and Tomatetama)) ... close your eyes/aisəs/!

Γ: Open your eyes /ais/! ((She pronounces eyes correctly.))

F: Open your eyes! /aIsəs/ ((She mispronounces the word 'eyes'. She picks one of the pictures from the board.))

These L2 competence related problems were grouped under the following headings: a) incorrect language use (e.g. mispronunciation, wrong word choice, wrong use of language structures etc.); b) leaving the problem unattended (not knowing how to correct an error or how to respond to a student's answer etc.); and c) inauthentic L2 use refers to the language use which does not comply with the authentic/natural native speaker use of the target language (e.g. unnatural language such as translation of French expressions into English etc.).

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🥯 Extract 9
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(S= Student, T=Teacher)

: Ehhhm....The other... you please...will make an exercise, Okay? ((He uses the wrong verb 'make' with the word exercise))

(some): Exercice?? ((Exercise?)) [Unclear and overlapping speech.]



Tumuhai, Miranda (Unclear speech). You work with me Okay? The others...You make... You will make an exercise. ((He uses the wrong verb 'make' with the word exercise))

: On va faire un exercice. [We will do an exercise.] [Unclear and overlapping speech.]

Inauthentic language use could be linked to language transfer or other cultural contextual influences. In general, these detected problems were minor and did not seem to be causing any harm to the learners' L2 development. However, the same types of mistakes were recurrently observed in almost all of the participants' discourse. Thus, this problem, despite its trivial nature, reveals to be an issue to consider in elementary school teachers' initial teacher education programme (see Figure 6).



Figure 6: Problems linked to the teachers' L2 competence (T=Teacher)

## 6) Learner Involvement

Issues concerning learner engagement in L2 classrooms have been the central topic in diverse SLA debates and research activities. Research in this area has focused both on the issues concerning learner participation, Teacher Talking Time (TTT), Student Talking Time (STT), teacher & learner interaction types, learner & cognition, learner initiation, classroom task types and so forth (Ellis,2012; Lier, 2007; Long, 1981,1983; Swain, 2001; Van Lier, 2008). The common point of these studies was learners' active engagement in their own L2 learning. It is now a common belief that active learner engagement is the key to L2 learning. However, it should be noted that learner participation using IRF structure, using mechanical repetition drills should not be considered as active learner engagement. Other, oral teacher-learner productions, which are the results of short question-answer type interactions, should not be mistaken for active learner participation. The results obtained from these six elementary school teachers' lessons indicated that these teachers (except T6) involved their learners in IRF type interactions based on short oral teacher-learner exchanges or mechanical repetition drills (see Figure 7).



Figure 7: Passive learner involvement (T=Teacher, L=Learners)

Only T6's classroom contained some elements which favoured active learner engagement (see Figures 8 & 9). The results from the interaction and video-recorded material analysis illustrated that the students in T6's class were more actively engaged in their learning than the students in other teachers' classrooms. In this classroom, the students had the opportunities to collaborate with each other and engage in negotiation of meaning (i.e. asking for confirmation, clarification, giving explanations, disagreeing, giving feedback). The students were arranged in a group of seven students and the task given to them afforded the learners the opportunities to be actively engaged in L2 learning. Extract 10 represents a good example for negotiation of meaning taking place between three students in T6 class. These students were seven years old had only a year of L2 learning experience. Their task was to take cards from a box, read maths operations to their classmates and ask each their classmates to give the answer.

P Extract	10
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(S = Student)

S7: ((Takes a flashcard from the box)) Fifty-one minus nine.

S6 : Is...

S7 : Je sais! ((I know!)) (( She raises her hand, turns her head and looks for the teacher.))

S7 : Sixty...

- S6 : Mais non! Moins! On a dit moins...((No, we said 'minus'.))
- S6 : On a pas dit "plus"! ((We did not say 'plus'.))
- S6 : Fifty...Fifty-two! Fifty-two!
- S4 : Quarante! Quarante! ((Forty ! Forty !))
- S7 : Forty-two!
- S6: Non, FORTY-TWO! Forty-two!
- S7 : J'ai dit avant toi.((I said it before you.)





Figure 8: Active learner involvement (T=Teacher, L=Learners)

A number of studies have reported that small group activities help learners produce not only a greater quantity of language and but also better quality language compared to learners in traditional teacher-oriented classroom settings (Ellis, 2003, 2012; Lier, 2007; Long 1981,1983). Group work also provides learners with the opportunities to negotiate for meaning when a communication problem arises. These studies maintained that group work can offer interactional conditions that facilitate L2 learning more easily than interactions involving only teacher-student exchanges.

Figure 9 displays that the five teachers out of six favoured non-communicative activities (i.e. mechanical activities) over activities based on real-life needs. The results also suggest that these teachers (except T6,) spent more time performing whole-class IRF than group activities that promote interaction and language production (output).



Figure 9: Activity types used in minutes (T=Teacher)



#### CONCLUSION

Several studies have reported that understanding messages conveyed by the teacher or engaging in controlled teacher-fronted mechanical activities (e.g. repetition drills or question-answer exercises) are not the sufficient conditions for learners to lean an L2. It has been repeatedly reported that face-to-face small group interactions through which learners engage in cognitive activities provide the necessary conditions to use and improve L2 learning. The summary of the results showed that among these six teachers only T6 used group work activities through which the learners could engage in negotiation of meaning and free, learner initiated language production.

In this study, the analysis of the learners' and teacher's classroom interactions displayed that, although the teachers used various forms of scaffolding and feedback strategies, the following points required consideration:

The roles the learners played in the classroom were predominantly passive.

There were very limited real-life exchanges and group-work activitie

The activities that the learners were provided with did not encourage cognitive learner engagement.

The learners were primarily provided with IRF interactio

The majority of the exchanges were in the form of simple repetitions or short question-answer type exchanges. Few of the exchanges were learner initiated.

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# Utilising the Capability Approach to Evaluate Final-Year Student Teachers Achievement in Indonesia

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## ABSTRACT

Students in bachelor degree in education have been criticised as lack of pedagogical and professional competences which causes poor teacher quality in Indonesia. Drawing on a recently completed Master's degree research, this paper attempts to explore what students are able to do and to be in the end of four-year bachelor degree in education by using the Capability Approach concept. Qualitative data from semi-structured interviews with four student teachers in a teacher education institution will help to contextualise this framework and present thick description of their experiences and beliefs. By exploring student teacher perspectives through the capability approach lens, it is expected that a broader understanding of teacher candidate performance might be gained for further preservice teacher education development.

Initial teacher education, preservice teachers, capability approach, qualitative study

## **INTRODUCTION**

The importance of teachers' role in providing quality education has been overtly stated by the Government of Indonesia, however, concerns about the quality of initial teacher preparation for aspiring teachers continue (MoEC, 201, 2015; MoRTHE, 2015, 2016; Chang, et al., 2014). The Indonesian Government has been endorsing a postgraduate teacher certification programme in order to improve the preparation of preservice teachers (MoRTHE, 2016). This arrangement allows any bachelor degree graduates to be teachers by obtaining teacher certification is known as consecutive teacher education, with emphasis on four teacher competences of pedagogy, professionalism, social and personal. Research in Indonesian context has widely situated bachelor degree in education or in a concurrent teacher education programme has not been able to produce teachers with sufficient pedagogical and professional competences (Zein, 2016) and lack of motivation as well as self-efficacy to teach (Kuswandono, 2014a, 2014b). These bodies of research are mostly missing a comprehensive evaluation of student teachers' performances. It seems obvious to state that a didactic teacher education programme curriculum contributes to low competences and motivation, but what other aspects that relate to student teachers' achievement in their degree has been missing in previous studies.

Therefore, this paper utilises the Capability Approach to investigate broader potential factors that affects what aspiring teachers are able to do and to be. It will review relevant literature that discuss preservice teachers' performance and then it will use the Capability Approach to provide an alternative interpretation of these, particularly regarding to how they relate to individual professional capabilities. Data gathered at a faculty of education in a private university in a sub-urban area of Java Island, Indonesia, will be used to contextualise the state of student teachers in Indonesia and this will then be critically analysed within the Capability Approach to demonstrate the supporting and constraining factors that influence what student teachers achieve. This analysis is purposed to articulate what are student teachers valued as important beings and doings for becoming future teachers and what are the factors behind these beings and doings. Moreover, it is also expected that by reframing student teachers' perspectives in this way, a more nuanced understanding of preservice teachers might be gained for prospective improvement in initial teacher education development.

#### **Depiction of Student Teachers in Indonesia**

Before the review of literature about student teachers in Indonesia is presented, an overview about Indonesians diversity due to spatial and cultural characteristics will be the backdrop of this study. Indonesia is the largest archipelago country (17,504 islands) and the fourth most populous country (over 250 million people) (BPS, 2017). Indonesia is also one of the most diverse country with 643 vernacular languages, 1,300 ethnicities and six official religions (Islam, Protestant, Catholicism, Hinduism, Buddhism and Confucianism) (BPS, 2011). These

complex diversities later can be seen emerging within the student teachers' bodies, such as in personal innate characteristics, interest, spatial and sociocultural circumstances.

It is difficult to generalise the student teachers' characteristics in Indonesia. The Ministry of Research Technology and Higher Education statistics (2017) record approximately 1.2 million students in bachelor degree of education (out of 6 million students in all bachelor degree level) enrolled to various teacher education programmes in private institutions (3,083 programmes) or public institutions (1,437 programmes) which are distributed in 34 provinces. Despite the doubled number of private teacher education programme choices, public institutions (692 thousands of students) are still favourable rather than the private institutions (595 thousands of students). In addition to that, each university has autonomy to set own standards of education which referring to the national standards, thus are no typical initial teacher education programmes in Indonesia.

Hence, there are broad literature that discourses what student teachers are able to do and to be in different backdrops of institutional settings or time framing. Most of previous studies contextualise the research related student teachers either in a specific teacher education programme, a particular teacher education institution or several teacher education institutions in the same province. Consequently, they tend to suggest for analytical generalisation to what the study discovered. But still, certain performance of student teachers is often cited as constitutive of unprepared teacher candidates such as lack of pedagogical content knowledge (Zein, 2015), lack of reflective skill and having weak intrinsic motivation to be teachers (Kuswandono, 2014). Kuswandono (2014) found student teachers' choice tend to be influenced by external encouragements from parents and/or teachers as well as prospectus settled career. Contrast to that study, Afrianto (2014) and Tustiawati (2017) found in different context of research in Riau and Bali province respectively, preservice English teachers had altruistic and intrinsic motivations in becoming teachers such as interest to work with young kids and enjoying teaching. These studies are realistic and imperative to count student teachers' voices which often being neglected in understanding their choices. Yet, these stories have not been able to connect the implication of those motives to what student teachers are able to do and to be in professional settings. Thus, there is a need for a framework that can describe and analyse the not only the personal motivations behind actual achievements as student teachers in the end of their teaching preparation in bachelor degree level, but also further exploration to other contextual factors that impinge student teachers' pursuit of professional capabilities as aspiring teachers.

#### The Capability Approach: Defining Professional Capabilities

The Capability Approach is a broad interdisciplinary evaluative framework that introduced by a philosopher and an economist Amartya Sen (1999) (Robeyns, 2005b, p. 191). Sen (1999, 2009) aspires this framework initially to complement human development evaluation measurement beyond merely income. Sen (1999) argues, human beings are unique because of their innate abilities, interest and talents, therefore a normative paradigm has to ground the assessment of the quality-of-life. This breadth of diversity is elaborated as conversion factors which comprise personal, social and environmental elements that can support or constraint individual pursuit of capabilities (Robeyns I. , 2005a). Capabilities itself is a set of real freedom or opportunities to achieve certain beings and doings that they value as important (Nussbaum, Creating Capabilities: the human development approach, 2011, p. 18). Furthermore, an individual ability to make choice or agency is critical to the achieved functionings as illustrated in Figure 1.



Figure 1 The Conceptualisation of Capability Approach (Robeyns I., 2005a, p. 98)

In the past decade, a growing body of literature apply this framework, not only to evaluate public policies but also various organisations practices as a comprehensive evaluation method (Alkire, 2005). Theoretically the conceptualisation of capabilities is closely related to human rights paradigm because it is rooted on individual entitlement, therefore it can be both supplementation and critique reciprocally (Nussbaum, 2011, p. 24; Sen, , 2005; Robeyns, , 2006). However, Martha Nussbaum (2003, 2011) critiques The Capability Approach which is endorsed by Sen., due to the absence of the fundamental list of capabilities in Sen's approach. In which, Nussbaum argues it conveys potential inequality in collective sphere (Robeyns, 2005b). Nevertheless, this study is still drawing on the democratic version of Capability Approach by Sen (1999) which allowing individuals to articulate what they are able to do and to be within their context to gain a rigor and rich understanding. Therefore, the expression of agency in individual decision making is the key to this approach.

Scholars concord, education from the Capability Approach lens has not only the instrumental values as means to multiply capabilities but also encompasses intrinsic values as the goals of education itself (Sen, 1999; Unterhalter, 2013; Robeyns, , 2006). In broader perspective, Chiappero-Martinetti & Sabadash (2014) demonstrates education as the (1) means, (2) conversion factors, (3) ends of capabilities development. Drawing to the higher education context where this study concetrates, Walker and McLean (2013) operates university education as professional education which prepares students to contribute in the society, particularly to povertyreduction. Although Walker and McLean (2013) case-study context is in South Africa is different than this study which is in Indonesia, some applicable ideas of how the framework was operated can be referred in the analysis. Walker and McLean (2013, p.2) work sheds the light to various potential normative public-good professional capabilities that are acquired through university education such as (1) knowledge and skills, (2) informed vision, (3) affiliation, (4) resilience, (5) social and collective struggle, (6) emotional reflexivity, (7) integrity and (8) assurance and confidence. These professional capabilities are shaped by a set of educational arrangements at departmental and university level, which are influenced by social, economic, political, cultural, and historical factors (Walker & McLean, 2013, p. 2). Bearing in mind these notions of professional capabilities in a general higher education context, how different students use their agency lead to various achievement depend on their their programme or specialisation are expected to be captured in a more nuanced yet specified manifestation of professional capabilities in teacher education contexts.

This study operates the Capability Approach to understand student teachers' pursuit of professional capabilities, therefore a linkage to existing literature about teachers will be also discussed due to the underexplored focus in student teachers. Alison Buckler's (2015b) work in quality teaching in Sub-Saharan Africa provides a good example of how professional capabilities notion is applied in understanding teachers' work. Buckler (2015b) suggests that evaluating teachers' agency can help the study to explore beyond a set of teachers' competences that most of governments demanding. In a broader literature, a work of Priestley, Biesta and Robinson (2015, p.29) about teacher agency suggest a correlation to what teachers perform as achievement of their agency. Although their work mainly referring to the context of in-service teachers and not using the Capability Approach, Priestley, et al., (2015) study is still helpful to contextualise the abstract idea of agency in the professional capabilities for teacher candidates which this research is aiming for. Priestley, et al., (2015) endorse the model of the achievement of agency is undoubtedly influenced by professional and personal experiences. Priestley, et al., (2015, p.30) add in the real world, agency can be restricted or reinforced by cultural, sociostructural and material circumstances. As the issue of student teachers' capabilities is still underinvestigated in the research in Indonesia, specifically on how student teachers articulate constraining and supporting factors that they experience, this research attempts be receptive to these aspects.

## METHODOLOGY

For the purpose of understanding student teachers' professional capabilities, empirical data were collected from the Banten province within last two weeks of May 2017 at one suburban private university. A sequence of obtaining access and consent from the university and participants were done as a part of author's dissertation fieldwork. In-depth interviews were conducted as the data collection method (Robson, 2011; Miles, Huberman, & Saldaña, 2014). All interviews were conducted in Indonesian language for half to an hour length, audio-recorded, transcribed and translated into English. The findings in the next section will be presented

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anonymously, therefore each student teacher's narrative will be labelled in number. These steps are time-consuming, yet it is important to familiarise with the data before it is analysed (Robson, 2011).

Four voluntary participating student teachers were recruited with combination of different study programmes (Biology, Primary, Mathematics and Economics), gender (two women and two men) and sociocultural background to add the breadth and richness of the data to the study (Table 1). However, all four student teachers had similarities in cohort of study (2013-2017), age range (21-23 years old), religious affiliation (Christian). Furthermore, greater homogeneity in institutional context such as holding full-ride scholarship with binding-contract, compulsory modules (religion, citizenship and Indonesian language), educational modules (Pedagogy 1-3, Curriculum Development, Study Skills, Teaching and Learning Theories, Psychological Education, Methods in Educational Research, Practicums), Theological modules and Thesis. Within this backdrop, a potential take-away from this study should be done analytically. Lastly, a thematic analysis was implemented to examine the data themes for in-depth analysis from the four student teachers by operating the Capability Approach in the following sections.

Student teacher	Programme	Gender	Place of origins
1	Economics	Female	Banten Province
2	Primary	Female	Maluku Province
3	Biology	Male	East Nusa Tenggara Province
4	Mathematics	Male	Riau Province

Table 1	Description	of the	Participants	of This	Study
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## FINDINGS

This finding section will draws on democratic way of defining capabilities from each student teacher's description of what they are able to do and to be as important to become good teachers in a *thick description* (Miles, Huberman, & Saldaña, 2014). Then in next discussion section, four major themes of student teachers' narratives of their professional capabilities.

## Student Teacher 1 (ST1)

ST1's main motives of becoming teachers was only because the university close to her parents' house because her parents did not allow her to commute or stay far away from them. Although her family perceive teacher has a low social status and financial prospects, she decided to do so considering the benefits of the scholarship programme which can decrease parents' financial burden and opportunity to move out from her parents' house. Gradually, ST1's family turns to be supportive and encouraging her in her study. ST1 believes it is important for her to be a good role model for her future students because she was inspired by her former elementary teacher and her thesis supervisor who were so dedicated. "...If I want to be followed by my students, I have to begin with myself...". ST1 also acquires organisational skills through her experiences in university organisations. ST1 believes her teaching practices experiences help her to be able to have a broad knowledge which enables teachers to stimulate students' creativity and to design constructive consequences. Also, practicum experiences help her in developing her confidence in teaching. Additionally, ST1 exercises her reflective skills through theological and biblical classes which are included in the institutions' curriculum.

## Student Teacher 2 (ST2)

ST2 has been aspiring to be a teacher since she was at school. ST2 believes her curiosity and assertiveness help her to developing a holistic and broad content knowledge and pedagogical skill. ST2 values integrity as the most important thing to be a teacher due to her bad experience with apathetic teachers at school. "Honestly, when I was at school, I felt different about teachers that I learn here. Because my teachers were mostly left school after lessons. They did not wait until the school was dismissed...for most of the time, the lessons were not for learning because the teaching was stick to the textbook so that were did not understand what she taught. We were self-studied at home, otherwise we would struggle for exams". ST2 believes what her teacher mentor in teaching practicum emphasised about building community in the classroom to make students feel accepted.



#### Student Teacher 3 (ST 3)

ST3's intention to be a teacher was influenced by his teacher at his senior secondary school. ST3 believes education can break poverty, yet he often feels having a low self-esteem due to his low economic background. ST3 believes his openness to receive critiques and learning new things will help him to adapt in various communities. ST3 brings regularly how his teaching practicums helped him to prepare in pedagogical and content for teaching. ST3 gains his confident which he was not owned at the first practicum. ST3 attempts to integrate his faith and subject matter in teaching as well as giving a pastoral care. "I felt how is being a teacher. that experience helps me to prepare myself when I have my own class. I understand the real feeling to teach. How to handle misbehave and alienate students.... after a while he realised that his choice was wrong... he got that holistically, content and spirituality... he finally changed and wrote a long letter to apologise and thank me. He felt his life was changed by me and he was rebuked by me...".

#### Student Teacher (ST 4)

ST4's family monetary crisis was the main consideration of his taking the scholarship offer to be a teacher. ST4 admits he has a low self-esteem due to his experience of being rejected with other ethnicity and religious affinities. Even though ST4 had a good intention to ease his family burden with the scholarship offer, his family perceived teacher as a low paid profession. ST4 admits his family is still money-oriented ones. ST4 believes a teacher must have a passion to teach, he admits he was inspired by one of teacher educators who showed dedication in teaching. ST4 values every interaction with his peers and TEs as well as students and teacher mentor in teaching practices help him to deal with diversities. Further, it helps ST4's to develop personal confidence and his professional confidence. "I am quite confidence with my ability to deliver materials, designing rules and procedures in a classroom so that students will listen to me. I am confident enough because of teaching practices. I am pleased and confident that I will teach well in the future".

## DISCUSSION

As discussed previously, the Capability Approach can be operated to evaluate comprehensively the factors that affect individual's effective opportunities to achieve what they value as important. In this case, what student teachers think as important to be achieved aspiring teachers are often caused by multiple factors that stimulating or contending their potential functionings. Following subsections will highlight professional capabilities that expressed by the student teachers from the interview which may contrast and/or underpin the preceding study.

#### **BECOMING A ROLE MODEL**

A profound notion of a teacher as a role model is demonstrated by all student teachers who participated in this study. In glimpse, student teachers refer the significance of being a role model from the Javanese words of wisdom, teacher is respected and imitated (*guru digugu dan ditiru*). A seminal work of Walker and McLean (2013), becoming a role model is nuanced to the importance of having knowledge and skill, also integrity in words and deeds. When this capability is explored thorough, interestingly, ST1, ST3 and ST4 associate their aspiration to be a role model for future students from some inspiring teachers, while ST2 expressed different reason. "...I felt the most important thing that I do not want to be a teacher like them (her teachers at school). I want to be a teacher who really teach and following every regulation so that my students could imitate me" (ST2). Contrast to other responses, ST2 reflects her bad experience in the past and converts this to be a supporting professional capability in becoming a role model for her future students. These various personal responses from the student teachers demonstrate the underlying assumption that Sen (1999) and Robeyns (2005) suggest in the Capability Approach that human beings are diverse. Furthermore, conversion factors as illustrated by Robeyns (2005) in figure 1, social conversion factors such as student teachers' relationships with their teachers can be supporting element to their pursuit of professional capabilities.

#### HAVING A CONFIDENCE

Some responses from the student teachers indicate that having a confidence to teach is essential in their trajectories in becoming teachers. "...some of them said they enjoyed when I was teaching. This made me have more confidence to teach" (ST1). Similar response came from ST4, "I am quite confidence with my ability to deliver materials, designing rules and procedures in a classroom so that students will listen to me. I am confident enough because of teaching practices. I am pleased and confident that I will teach well in the future" (ST4).



These expressions connect to what Walker and McLean (2013, p.2) inform about confidence as one of the professional capabilities. When they were asked further in the interviews, they refer to the doubt from families about financial prospects in becoming a teacher, however the teaching practices stimulate this capabilities. Therefore, teaching practices as education arrangements perform as means to achieve their professional capabilities (Walker & McLean, 2013).

#### DEALING WITH DIVERSITY

A prompt and honest response from ST4 who experienced being rejected by peers at school found that dealing with diversity is pivotal in becoming a teacher, particularly by realising that in the future as a teacher, he will work with diverse students and colleagues. "I have been equipped how to interact with people from different background than me...I feel satisfied with my development during more or less four years in this institution. Initially, I was so afraid to reproach people even for a good intention. I am brave enough to express my thoughts or my disagreement so I am not keeping it by myself" (ST4). As Priestley, et al., (2015) underpin about the idea of teacher agency, that social relationship influence student teachers to exercise their agency. In Walker and McLean (2013), the capabilities to deal with diversity relates to individuals' emotional reflexivity and social struggles. And even though this ST4's personal experience constrained his personal capabilities in the past, his aspiration to shift his fear to interact with people brings the fact that his experience in building relationship througout the study help them to achieve this professional capabilities.

#### CONCLUSION

If student teachers' capabilities are defined as achieving what they value as important to do and to be, then this article has offered bottom-up expression of student teachers' professional capabilities which is rarely measured formally and qualitatively. By investigating student teachers' pursuit of professional capabilities, this paper unpacked the factors that affecting what they are able to do and to be during their study. Moreover, by exploring student teachers' perspective, this paper also revealed that student teachers may have been able to achieve competences that the Indonesian government set for in-service teachers. Operating the Capability Approach to evaluate student teachers' capabilities also revealed that the idea of freedom has not been able to be articulated yet, they recognise it through the idea of effective opportunity.

Generally, student teachers' capabilities are evaluated through module or final grades, postgraduate in teacher education profession national selection or job application, the focus is still the competences without considering the process of achieving that outcomes. The factors behind student teachers' achievement is under-investigated in the broader debate around teacher quality and education quality, thus, the Capability Approach can unpack this process. Finally, regardless the small-sample of this research, this paper can be an example how this framework is applied to understand student teachers' capabilities.

#### ACKNOWLEDGEMENT

I would like to thank the Indonesian Endowment Fund for Education (LPDP) for supporting this research, the Institute of Education University College London and my research participants and staffs in the teacher education institution where the fieldwork was conducted.

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## Visions of Students of Pedagogy about Kindergartens

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## ABSTRACT

This paper discusses female pedagogy students' visions of kindergartens. Visions are operationalized as a sort of reconstructing procedure of previously experienced things, but they also leave space for creativity, and can be variously combined into new, unique visions that are no longer mental reflections of reality. The research method was thematic writing about the visions of the students. The research sample consisted of 40 female students enrolled in the 1st year of the bachelor's degree programme Kindergarten Education. It was an intentional decision to choose students at the beginning of their studies, as at that time they are not yet much influenced by the knowledge acquired during their studies. The aim of the research was to discover how female students envision kindergartens, how kindergarten has changed since they attended it as children, what kindergartens should be like, and also what the kindergarten teacher should be like. Consequently, content analysis of all obtained data was carried out. The results show that the students' visions of kindergartens are connected mostly to the kindergarten environment, and the appropriate kindergarten activities. For the students, cooperation between the kindergartens and the families is of key importance. Moreover, students consider kindergarten an institution that should prepare children for future life. Changes which the students noticed in comparison to when they attended kindergarten were predominantly in the attitude towards children in the kindergarten environment and in the legislation. As far as the female students' visions of kindergarten teachers go, they consider it crucial that the teacher has a positive attitude towards children and a university degree.

## INTRODUCTION

When one decides to study the Kindergarten Education degree programme, it is likely that they take a genuine interest in this field and also that they have certain visions of kindergartens. It can be assumed that these visions stem from their own kindergarten experience, as the majority of the students attended kindergarten in their childhood. As with any other type of visions, female students' visions about kindergartens stem from their memories and the experience they have gained so far. Visions can be defined as a reconstruction of what has been perceived, but they also leave space for creativity, and can be variously combined into new shapes that are consequently no longer a mental picture of reality, but rather a specific mental structure (Nakonečný, 1997). This definition was crucial for the purposes of the research. Female students' visions captured by this research arise from their own kindergarten experience, with which they further operated in their minds. And, based upon these experiences, they created and defined their own new kindergarten visions.

Our visions are formed by experience. Experience stems from a person's own reality and is very individual - subjective for everyone. Hence, visions, which are influenced by our experience, are subjective as well. Experience can be defined as what has been experienced and stored in the memory of an individual. It is not a passive item stored in the memory, but rather an active element. The process of gaining experience, and changes that experience consequently evokes, is the essence of learning. Experience is the source of knowledge for humans, and also the means for interaction with the environment (Hartl, Hartlová, 2010).

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Visions are closely connected to memories. In some interpretations, a combination of these two concepts can be found. These are the so-called memory visions. It can be said that the memories we are able to recall in our minds at the present are notions of once real-life events. Our own memories very strongly influence the new visions that we create in our minds. The assumption is that the female students' memories of kindergarten influence their current visions of it.

Memories can be also described as notions which revive previously experienced events. These notions are accompanied by the emotional experience related to the moment of their origin. They can be influenced by the emotional state at the moment of their recall. Long forgotten and artificially recalled memories always have a strong emotional accompaniment. Based on this, it can be concluded that for the most part, emotional memory is more lasting than factographic memory. This was obvious in the statements of the research participants as well. Participants recall predominantly emotionally stronger memories from their childhood.

So, how do the pedagogy students picture kindergarten, what scope do their visions possess and what are they based on? Are the female students' visions similar or do they differ in some aspects? In the following segment, it will be attempted to find answers to these questions.

## THE STUDY

As suggested before, the aim of this research was to fulfil certain goals. The aim of this research was:

- to clarify the visions of the pedagogy students about kindergartens;
- to uncover how the pedagogy students picture the kindergarten environment;
- to uncover the visions of female pedagogy students about the philosophy and concept of kindergarten;
- to describe the visions of the female students about the profession of a kindergarten teacher

The methodology used for the data collection was thematic writing. This is a free style of writing, where the participants write an assignment based on a topic announced beforehand. As the writing is free, the researcher does not control or interfere in the process, and the final text is not limited in scope. In thematic writing, the participants are able to express their subjective views (Wiegerová, Gavora, 2014). Ist year kindergarten pedagogy students were approached for the purpose of this research. They willingly described their visions regarding kindergartens. Participation in this research was voluntary. The assignments were written by hand, and later re-written into an electronic version. The participants were not restricted by the word count or limited by time. Texts were submitted anonymously.

The selected sample consisted of 40 participants, future kindergarten teachers. The way the research sample was selected for the purpose of this research was evaluated as available. The research group therefore consisted of 40 female full-time students aged 19-20. As a research group, 1st year students were selected as it was assumed that their visions are not yet much influenced by their university studies, but rather are mostly based on their own kindergarten experiences.

For the data evaluation, content analysis of the products - written assignments - was used. Open coding was used. In the analysis process, texts were divided into segments - meaning units. Consequently, the meanings were identified using open coding in the segments and the meanings were marked with codes. The individual segments were repeatedly read, the codes were modified and revised with the intent to best capture the range of data obtained. It was followed by grouping the codes into categories with similar meanings, followed by their description and explanation. There were some limitations to the research process. These mainly relate to the construction of the research sample.



The sample selection may indicate decreased credibility of the research. In this case, this is connected to the fact that the students were already part of the academic environment, where they were gaining and deepening their theoretical knowledge as well as developing their pedagogical competencies for kindergarten work. Distortions in the research results could have been caused by the researchers. Thorough knowledge of the research field can mean higher credibility of the results, but on the other hand, it might also contribute to data distortion caused by the researchers themselves. In this case, the in-detail knowledge of the academic environment, personal contacts with the students, and also knowledge of the institutionalized kindergarten environment might have a similar effect.

#### FINDINGS

There were five main topics detected in the participants' accounts that they commented on. These are the following: memories of the kindergarten years, memories of kindergarten teachers, changes in kindergartens, what the kindergarten environment should be like, and what the kindergarten teacher should be like.

#### Memories of the kindergarten years

One of the topics that occurred in the statements was memories of the kindergarten years. As mentioned earlier, the visions are based on one's own experience, and are heavily influenced by it. Analogically, participants very frequently mentioned their own childhood memories and kindergarten experience in their accounts. Positive as well as negative memories of particular activities they were forced to participate in came up. Based on their testimonies, it can be observed that the participants tend to recall mostly various extraordinary happenings that took place in the kindergarten, or other key moments that affected the participants enough to remember them. The majority of the participants agreed that they do not recollect the day-to-day running of the kindergarten or the activities the teachers did with them.

"But I greatly enjoyed carnivals, where we were in disguise, and also birthday parties. During these, each birthday boy/girl was nicely dressed, received a candle cake, and was sat down on a blue throne and photographed. We were looking forward to it all year."

These memories were further divided into memories of one's own childhood and memories of a kindergarten pedagogical practice, which took place either during high school or at university. Havel and Janík (2004) stress the importance of the pedagogical praxis. They perceive it as an opportunity for the students to use their acquired theoretical and professional knowledge in practice. The student is given a certain degree of responsibility for his/her decision-making at this stage. That is why consequent reflection is important as well. Thanks to this reflection, the student can become aware of their limitations and gaps in their professional competence.

#### Memories of kindergarten teachers

Another type of memory that appeared in the data was those of kindergarten teachers dating back to the time participants attended kindergarten. These memories were positive as well as negative. From the interviews with the participants, it is obvious that kindergarten teachers play an important role in the memories of participants and that they influenced these memories heavily. The students relied in their statements on their own experience with the teachers. Among the positive memories of the teachers, personal characteristics such as smiling, popular, inventive, and a positive attitude towards children prevailed.

"We had a teacher who had a truly amazing relationship with the children and it was thanks to her that many children enjoyed kindergarten. She was always playing with the children, when we arrived at the kindergarten she always greeted us, hugged and took us to the other children."

In terms of good relationships with the children, the concept of pedagogical love is also mentioned in the literature (Lukášová, 2015). Pedagogical love is an expression of an emotion towards the child. It is an emotion that helps children to cultivate their own feelings for the educational efforts of the school. Further, it reassures the children that they will get understanding and support in their efforts.

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As far as the negative memories of teachers are concerned, personal characteristics with a negative colour occur, such as unlikeable. Here, mostly negative or conflict situations occur, in which the teacher appears or which were directly caused by her. In two papers, memories of physical punishment on the part of the kindergarten teachers appeared.

## Changes in kindergarten education

As the students mentioned in their statements, kindergarten has undergone some changes since the time they attended it. Participants compared what has changed in the kindergartens since their childhood. They also assessed whether they perceived these changes as positive or, rather, as negative. The first area the students point to in this part of their accounts is related to the changes in the kindergarten environment and kindergarten equipment. Students identified implementation of modern technologies into kindergartens. Further, students noticed changes in the approach of the teachers towards children. They pointed out the efforts to support the child's individuality, whether in choosing an activity or choosing food.

"I dare to say the approach of the teachers has changed. No one forces the children to participate in any activities, or to eat certain foods any longer. They have a choice. Today's children have the opportunity to do what they want to and how they want to. We did not have such an opportunity."

Another key change from the students' point of view is the inclusion of two-year-olds into kindergartens. Because this question is gaining in prominence, scientific literature comments on it as well. This issue is discussed on various levels and in several spheres. Overall, however, it is clear that for the successful inclusion of two-year-olds in kindergartens it will be necessary to adjust the conditions - e.g. reducing the number of children in the classroom, enhancing pedagogical and non-pedagogical staff, adjusting the daily regime, psychohygienic conditions, space, equipment, etc. It is necessary to accept the evolutionary particularities and needs of the children of this age category. These changes should be reflected in the teachers' preparation for the classes and in their education (Opravilová, 2016). Consequently, the students pointed at the genesis of kindergarten pedagogy as a scientific field that has lately been developing rapidly.

"I observe higher professionalism and higher interest in children, more scientific books and studies about preschool children and how to approach them."

One of the transformations that kindergartens have undergone was the penetration of elements of alternative pedagogy into the current " kindergarten market" in the Czech environment. In comparison to the present, in times when the participants attended kindergarten, there was a model for the kindergartens and all kindergartens were based on that same concept. At the present time, the parents have more options, there are more types of schools with various focuses and there is a broad range of alternative kindergartens.

Further, the students commented on the system and legislative changes in kindergartens.

"Kindergartens were changed a lot due to the implementation of the Framework Educational Programme for Preschool Education. Teachers had to change almost everything and with the help of this programme the daily schedule changed a lot as well."

However, claims that some kindergartens have remained the same occurred in the accounts as well.

## How the kindergarten should look

The most significant results extracted from the data obtained from students were their visions of kindergartens. The participants pretty much stated in their texts what an ideal kindergarten should look like from their perspective, or what a kindergarten where the participants would like to work in the future should look like. The first area mentioned by the participants in their statements concerns the opinion that a kindergarten should offer an interesting, pleasant and, above all, motivating environment.

"Children usually spend all their days in the kindergarten. Hence, an environment that will provide them with various activities and will enable their individual development should be created."

The kindergarten environment is specific in that it is adjusted to the height of the preschool children. Objects are accessible to the children so they can easily reach them. Preschool children explore the environment through their senses, and the environment is adjusted accordingly. The kindergarten environment should be colourful, diverse in terms of materials and shapes, and there should be enough room for free movement of the children (Koťátková, 2008). Participants' statements were in concordance with the above-stated definition.

Further, participants commented on the type of activities that take place in kindergartens. They agree that the activities offered should be diverse, and they also commented on their level of organization. An interesting topic that came up in the statements is the development of one's individuality vs. its suppression for the purposes of adaptation to the group. Whereas the majority of the participants believe that it is crucial to support children's individuality and to adapt their work accordingly, one participant opposes this idea and puts the interests of the group first. Even if this should be at the expense of one's individuality. She even suggests the suppression of the child's identity.

The students also mentioned that kindergarten should ensure a quality preparation of the children for entering primary school. Further, they agreed that kindergarten should support the socialization process of the children in the kindergarten.

Cooperation between kindergartens and families was another of the areas that the participants commented on. Successful cooperation with the parents enables the teacher to gain a lot of precious information about the child, and it helps him/her to get to know the child better. This enables the teacher to more effectively educate the child, which was something the students agreed with. Studies show that to incorporate the parents into the educational process leads to the child's success at school and is connected to their socio-economic development (Syslová, Borkovcová, Průcha, 2014).

Further, the students also express their opinions on the composition of children in a kindergarten class both in terms of the number of children in class as well as in terms of homogeneous and heterogeneous classes. Last but not least, the students stress the importance of versatile development of children.

"The main aspect that a kindergarten should have or, more precisely, offer to the children are opportunities. Within the kindergarten environment, I would see this more so as an opportunity to express their creativity, an opportunity to make a decision (what I want to do) etc....It should support the children's development and give them an opportunity for self-expression."

## Visions about kindergarten teachers

The final area which occurred in the students' statements was related to how the students picture kindergarten teachers. Similarly to the previous area, the participants also described their rather idealised visions. As is obvious from the research "Child's learning" (Wiegerová, Gavora, 2016), students are aware that kindergarten children learn by observation and imitation of the people who influence them at that age. Kindergarten teachers are undoubtedly among such people. In the first part, the participants expressed their opinions about general characteristics of the kindergarten teacher. Here, the students mentioned what the teacher should be like in terms of his/her personal characteristics and what his/her skills and abilities should be.

"...a key element is the teacher who should help to create a pleasant environment. The teacher should be friendly, nice to children, but children should listen to her and respect her. Teachers should be active, try to motivate children and always capture their attention with something new."

Based on students' descriptions about what the ideal kindergarten teacher should be like, it can be assumed that this is the kind of teacher they would like to become in the future. As results from the research entitled "Self-efficacy of Students" (Gavora, Wiegerová, 2017) show, preschool education students generally show a high degree of self-efficacy, self-confidence, confidence in their abilities and their own potential for future employment.

The majority of the students mention that the teacher should have a positive attitude towards children, and also enthusiasm for the job. Personal characteristics of teachers are very important as well. The personal characteristics of the kindergarten climate. The willingness to communicate with the children, as well as with their parents, is crucial. Hence, the teacher should be able to communicate on two different communicative levels. Communication with the parents is different from communication with the children. One of the key characteristics of the kindergarten teacher is the ability to be emotionally engaging. Students agree that kindergarten teachers should like children. This claim is rooted in the fact that, in reality, they often come across teachers who are very unlike this.

Students also agree on the issue that the teacher should be a qualified professional. In terms of qualification, this area is closely connected to another one. Students express their opinion on the education of kindergarten teachers; many students believe that it is necessary for kindergarten teachers. Due to the increasing demands on kindergarten teachers, their university education at bachelor level should be ensured. This measure can be understood as an effort to upgrade their social and professional status (Rýdl, Šmelová, 2015).

"This, however, greatly depends on the teachers, and it depends on them what kind of atmosphere they are capable of creating... That is why I believe that university education is of a crucial importance as well as a good relationship with the children."

The research entitled "*Professionalization of university students of preschool education*" (Wiegerová, Svěrkošová, 2016) shows that the students realise that increasing kindergarten teachers' education helps not only improve the status of the teaching profession in the eyes of the public, but it primarily helps improve the quality of work of the kindergarten teacher. Thanks to the university studies, the student penetrates more deeply into this field, especially with regard to the theoretical background.

Another issue discussed was related to salaries. Students believe that it is important to raise the salaries of kindergarten teachers. Students claim that the salary raise would have a positive impact on the quality of the pedagogical work, and it would also raise the prestige of this occupation in the public eye.

### CONCLUSIONS

The accounts of the students in this research were very interesting and managed to cover a wide area of topics that relate to kindergarten. As was assumed, the students relied on their own kindergarten memories. The students discussed the activities and experiences they remember from their kindergarten times. Further, memories of the kindergarten teachers turned out to be of crucial importance. From the students' accounts, it is obvious that the teachers heavily influenced their kindergarten memories.

Since students have experience with kindergarten both from the time of their childhood as well as from the present time, from their studies and visits during school placements, the statements also contained a certain comparison of what kindergartens were like at the time when the students themselves were attending them as children, and of what kindergartens are like now.

Moreover, the students described their own visions of kindergartens, and it can be said that their visions were idealized. Hence the students described what the ideal kindergarten should be like. Last but not least, students expressed their opinions on the profession of a kindergarten teacher. These visions were idealized as well, as the students were describing some kind of ideal kindergarten teacher.

In the course of this research, it was successfully clarified what the visions of the pedagogy students about kindergartens are. Consequently, it was uncovered how pedagogy students picture the kindergarten environment. In addition, it was uncovered what the visions of the students regarding the philosophy and concept of the kindergartens are. Also, it was described how students view the profession of the kindergarten teacher. Hence, the research provided an opportunity to take a peek into future teachers' visions and showed what the nature of kindergartens as well ideal kindergarten teachers should be like.

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# What are the College Students' Perspectives Towards the Use of Synonyms for Learning English as a Foreign Language?

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## ABSTRACT

This work presents the perspectives of students regarding the use of synonyms for learning of English as a foreign language. This work was developed by using a case study as a methodological design. The participants of the study were 23 students enrolled in the Technical English I course from the Business Administration career and the International Business career of Universidad Técnica de Machala. The information was collected from direct observations conducted during the academic period of May-September 2017 and from two focus group discussions at the end of the semester. Thirteen participants were interviewed in the focus group, 13 students from the International Commerce career and 10 from the Business Administration career. For the focus groups, a questionnaire of three questions was applied which was previously validated by experts and aimed at exploring how the use of synonyms has helped the students learn English, its disadvantages, and which skills benefitted from the use of synonyms during the semester. The results of the study indicated that the students experienced an increase in vocabulary and improved their vocabulary comprehension. Synonym learning also helped them improve reading comprehension and writing skills. On the other hand, the students expressed that among the disadvantages of this technique, there are limitations related to the appropriate search of synonyms because of its multiple meanings. Similarly, another obstacle is the lack of vocabulary knowledge by learners which leads to employing too much time to find the synonym of a new term. Per the number of answers from students, the results reveal that the majority of participants consider that the use of synonyms brought more benefits than disadvantages to the learning of English language. In this way, it is concluded that the results of the present study confirm that the use of synonyms contributes positively to the learning of English as a foreign language. Hwever, it is necessary to consider factors that can condition its effectiveness such as the variety of multiplemeaning words and the proficiency level of students.

Keywords: Synonyms, vocabulary, reading comprehension, writing, college students, benefits, disadvantages

#### **INTRODUCTION**

Vocabulary learning is one of the fundamental pillars of the development of linguistic competences. That is, the higher the number of words recorded in the student's memory, the more linguistic resources the student will have to communicate a message, and in turn, to understand the messages received, whether written or spoken. The use of synonyms is a technique employed to familiarize the student with new vocabulary (Takač, 2008) to improve their mastery of the target language. The teaching of vocabulary through synonyms can be conducted by the introduction of word lists, search for synonyms in physical or online thesauri, and, currently, by the use of computer software.

Recent research shows that the application of synonyms can improve learners' writing skills. Chen, Huang, Chang, & Liou (2015), in their study, used lexical paraphrase (synonyms) to determine their influence in improving the writing of students of English as a foreign language. The authors of the study implemented lexical paraphrase through an online system called PREFER, which provided students with a wide range of paraphrase options while writing. As a result of the study, a better quality of written production was observed among participants. Another article, written by Yeh, Liou, & Li (2007), discussed the application of an online tool called TANGO, which had the same purpose. That is, to improve the writing of university students of English as a foreign language. Through TANGO, the authors provided students with synonyms of overused adjectives in writing such as important, beautiful, difficult, deep and great. The results of the study not only showed a better quality writing by the students but also, in subsequent tests up to two months after the conclusion of the treatment, the students were able to remember the learned synonyms.

Teaching vocabulary through synonyms requires special considerations on the part of the English teacher due to the number of existing synonyms, their level of complexity and the different levels of English that the students possess. Webb (2007) conducted a study with 84 Japanese students of English as a second language. Through the administration of ten tests to determine the learning of English words and its synonyms, their study examined the effects of learning two groups of words. The first group consisted of ten words that contained infrequent synonyms and the second one, also of ten words, but whose synonyms were quite frequent. The results of the study showed that the participants obtained better results when learning words that had known synonyms. Emphasizing the above, Nation (2001) expressed the importance of the connection between the acquired knowledge of the target language and the vocabulary to be learned.

Although the use of synonyms has been recognized as a technique that helps to increase students' vocabulary, Balc1 and Çakır (2011) consider this technique as traditional and less efficient compared to the use of other techniques such as the use of collocations. This assertion was generated by the results obtained in a comparative study developed by these authors on the level of effectiveness of the use of collocations and techniques such as the application of synonyms, antonyms, and definitions for vocabulary learning. The findings revealed that students who received the collocations technique scored better on vocabulary tests than those who received the other treatments.

Studies on the application of synonyms in vocabulary teaching present observations worthy of consideration by teachers of English as a foreign language. However, none of these have considered the views and perspectives of students. Therefore, taking into account this gap in the literature, from a case study, the present study analyzes the perspectives of university students in the use of synonyms for learning English as a foreign language. The results of this study provide English teachers with a deeper insight into the impact of the application of this technique from the perspective of apprentices who have been applying it in their learning process. Consequently, this study will allow teachers to reflect on with greater knowledge of the main benefits and limitations involved in the use of synonyms in teaching/learning English as a foreign language.

#### MATERIALS AND METHODS

This work was performed using the case study methodological design and direct observation. 23 out of a total of 52 randomly selected students participated in the study voluntarily; 11 women and 12 men whose age ranged between 20 and 25. 13 of the participants were enrolled in the 5th semester of the night section of the International Trade major and the remaining 10 in the 5th semester of the daytime section of the Business Administration major. Both groups were taking Technical English I at the Academic Unit of Business Sciences of the Technical University of Machala, Ecuador, during the first academic period 2017-2017.

Classes consisted of two-hour encounters, twice a week. Two of the researchers had the role of active researchers, encouraging in their daily classes the use of synonyms of English vocabulary covered in the content delivered during the semester between May and September. This facilitated the collection of data from direct observation by the two researchers throughout the semester. The data were also collected through two focus

groups discussions in which the twenty-three participants were interviewed with a questionnaire of three questions previously validated by experts (see Table 1). The focus group discussions were performed at the end of the academic period. The purpose of the focus group discussions was to explore how the use of synonyms had helped the participants learn English, their disadvantages and what skills were favored by the use of synonyms during the semester. For the organization of the data that were to be obtained from the focus group discussions and to maintain the anonymity of the individuals involved, each participant was represented with a code indicating their order of participation, gender and career they were attending, to say 1MIT is equivalent to One, Male, International Trade and 2FBM to Two, Female, Business Management.

Participants' responses were recorded and later on categorized and codified, determining ideas, concepts or similar themes (Rubin and Rubin, 1995). Categorization was performed using the qualitative data analysis software MAXQDA Analytics Pro. Finally, the results were discussed.

#### Table 1

Questions used in the focus group discussions

- 1 How has the use of synonyms helped you to learn English?
- 2 In your opinion, what are the disadvantages of using synonyms to learn English?
- 3 What skills (listening, speaking, reading, o writing) have the use of synonyms helped you to improve?

*Note*. Questions developed by the authors.

#### **RESULTS AND DISCUSSION**

The analysis of the data obtained from the students' answers resulted in two categories and six codes (see Table 2).

Table 2.

Table of categories and codes

Categories	Benefits	Disadvantages
CODES	a) Expansion and comprehension of vocabulary	f) Lack of vocabulary
CODES	b) Reading comprehension	g) Time-consuming
	c) Writing	h) Words with multiple meanings

*Note:* Table with the two categories and respective codes.

The opinions of the participants reveal that the use of synonyms has a positive effect on English language learning. In this sense, Figure 1 shows the number of times students, in their responses, mentioned both the benefits and the disadvantages. It shows that, when referring to the use of synonyms for learning English, students mentioned more benefits than disadvantages. Observations carried out by the two active researchers support these findings, as they have witnessed the rapid progress of students while using this technique.

Figure 1. Categories support based on participants' answers



#### Benefits

Expansion and comprehension of vocabulary, reading comprehension and writing.

The data collected indicate that, according to the students' perspective, the use of synonyms helped them to understand and increase their vocabulary significantly. Likewise, students consistently expressed that this technique also helped them to comprehend reading passages and to improve the writing of texts or sentences in English (see the number of times the students mentioned opinions regarding these codes in Figure 2).

Typical responses from students which support these assertions are:

3FBA) "In short, the use of synonyms is of great importance because it allows a better understanding of the text and more quickly, without having to resort to our cell phones. In any case, I think that the use of synonyms allows the student or me to increase the vocabulary in English much more."

11MIT) "This technique has helped me to understand the meaning of a word and therefore to increase my vocabulary."

4MIT) "Writing because I have learned more words which I can apply in exercises."

The daily observations by the active researchers affirm the improvement in the understanding of texts, as well as a better understanding and increase of the lexicon of the students from the learning of synonyms. For example, when students did not know a word, they often resorted to their teachers to ask for their meaning, who instead of telling the meanings in Spanish, replied using a synonym; regularly a synonym whose spelling would be similar to their equivalent in Spanish.

As for the influence of synonyms on writing, students' responses connected with the findings reported in the studies conducted by Chen, Huang, Chang, & Liou (2015) and Yeh, Liou, & Li (2007) who mention how beneficial it was for their participants to use synonyms in the writing of texts in English.



#### Disadvantages

Lack of vocabulary, time-consuming, and words with multiple meanings.

Feedback from students also reflects three disadvantages, such as the opinion of three participants who expressed their concern about their lack vocabulary knowledge to identify the synonym for a new term. This point is evidenced in the response of 9FBA who expressed ... "the disadvantage may be that we do not understand what the word or synonym that we look for in English means." Regarding this finding, we take into account the results of the study conducted by Webb (2007), which showed that the learning of lexical units with synonyms known by the participants led to better results. This means that students with beginner proficiency of English may find it difficult to search for synonyms due to their limited knowledge of the language and insufficient vocabulary. In that sense, teachers of English as a foreign language should consider using synonyms that are known to students and avoiding those that are complex.

Likewise, three students concurred with the view that the use of synonyms is time-consuming. In relation to this, 3FBA stated: "as a disadvantage, it can be pointed out that searching for a synonym or adjusting a definition to a word takes some time." This may be due to the students' lack of knowledge about how to effectively search for a word in thesauri. For example, inexperience in how to identify the meaning or grammatical functions of a vocabulary words such as verbs, nouns, adjectives, etc. can add unnecessary time to searching for the correct synonym. Hence the importance of reviewing the procedures for finding terms in thesauri and dictionaries frequently.

Finally, a greater number of students, that is, eight of the participants considered the existence of words with multiple meanings as a disadvantage. Thus we have, for example, the criterion of the participant 1MBA, who said that "feedback is necessary because it will help us to know in what context and in which situations we will be able to use the synonyms of a word. In addition, at the moment we use these synonyms in writing, we must understand the consistency of the paragraph or sentence to be able to use them. It will also influence in a certain way our comprehension when we read." This suggests avoiding the presentation of vocabulary in the form of lists in which the student is prevented from knowing important details about the context in which the vocabulary is applied. The absence of contextual information prevents the proper functioning of the synonyms technique due to the limited information about the words studied. Hence the importance of introducing vocabulary using sentences or paragraphs.

#### CONCLUSIONS

The results of this study led us to determine that the use of synonyms represents a great potential in language teaching. In addition to increasing student vocabulary (which, among other factors, is crucial to effective communication), the use of synonyms in the English learning process helps improve writing and reading skills. However, like any technique, the use of synonyms also has disadvantages; which, taking into account the responses of several students, are linked to the lack of understanding of the meaning of the synonyms found, the amount of time their search demands, and the variety of meanings and contexts in which a synonym can be used.

Previous studies on the use of synonyms for vocabulary teaching have indicated that their application represents benefits for the student. However, prior to this study<sub>a</sub> it was unknown to what extent this technique contributes to the learning of English and the possible disadvantages that learners can find during its application according to the perspective of the learners themselves. After knowing the findings of this study, not only can teachers apply the technique with greater awareness of its benefits, but they can also anticipate some of the aspects that could limit the correct application of the technique to obtain optimal results. Finally, we believe that it is important to emphasize the high value of studies where the voice of the students is captured. Through these works, teachers can observe a more comprehensive picture of the impact that a pedagogical aspect has on the student.

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# Perception of Blended Learning Approaches in Higher Educator Sector: Critical Review and Proposed Learning Model for Imam Kadhim College for Islamic Science University

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## ABSTRACT

In past years, teaching in class rooms are conducted in traditional manner with broad range of learning activities and assist the learners to fulling the teaching and learning objectives. After the evolution of internet and WWW, there was a phenomenal change in education which overcomes the negative aspects of traditional learning. Mobile and e-learning technologies are introduced to facilitate and coordinate the teaching and learning activities among teachers and students in higher education institutions. Currently technology based learning is the latest channel introduced in higher education sectors, the outcome of technology based learning is blended learning approach which combines the two set of users: technologist and education facilitators. The major strength of adapting to blended learning is to combine the traditional learning approach (i.e. offline) to information technology assisted learning approach (i.e. Online), but there are still prospective research gaps of blended learning implementation based on different countries, institution and academic disciplines which is considered as challenge of the research. The main objective of this paper is to explore, analyse, review and compare the blended learning techniques in higher education sector and propose an effective blended learning model for Imam Kadhim University College (IKUC). The focus of the research is investigated based three set of questions: a) What are the existing blended learning strategies in higher education sector b) What are the outcomes based on comparative study on blended learning experiences c) How to design an effective and sustainable blended learning strategies for Imam Khadhim College for Islamic Science University (IKCISU). In this paper, the proposed blended learning model for higher education sector will indicate the enhancement and transformation of face to face learning blended with technology in a symbolic relationship representation. Based on our study findings, it is very important for educational users and technology users to establish a symbolic relationship and integration of inter disciplinary which will show an impact on individual users practice more than their own discipline. **Keywords**: Blended Learning, Teaching, Learning, Technology

## **INTRODUCTION**

Recent development in Information Technology have made a tremendous change in communicating with the people in the society and public. In higher learning institutions, change was influenced by technology for the users such as teachers and students. In academics, traditional learning will have more paper works and manual process of assistance is required by the students, but after the evolution of internet and web 2.0, students not need to carry the dozens of books or handouts, for research, students do not require to visit the library in manual process of burrow and renewal or to search for the articles. Learning environment becomes virtual, there were digital libraries, online journals and ICT based education tools are globally available in the market to provide effective teaching and learning. Innovations in technology have a great reflection in learning and teaching experiences, by accessing and communicating on the internet have made a change in modern education. Globally many universities are trying to adapt to the digital culture changes by putting more efforts on buying technology and resources and provide modern digital facilities for teachers and students to create an effective e-learning environment. Strength of E-Learning is to provide ample opportunities for the learners who are working and parallel studying, those who is engaged with active life styles and individuals who are in rural locations or unable to access the learning activities. E-learning alone will not solve the all the learning issues or gaps in education sectors, there while combining e-learning and blended learning together will provide an effective education for students.

As per today modern education shifts, higher education learning institutions are interrupted by digital culture. For example, one of author Caar-Chellma [1] have mentioned that e-learning is "breaking down the elitist wall of ivory tower". Another author Blair [2], most of the European countries are using technology to bring education in life where the teaching and learning can be enhanced.

Loveless [3] mentioned in his research that work and live in great times which influences the education with cultural and politics context which leads to a challenges in practice and beliefs. Keyword such as "e-learning", "blended learning", "technology based learning", "digital literacy" have been widely used in education sector. In specific, one of the most popular keyword is "blended learning" which has challenging nature of focusing on Face to Face (F2F) teaching embedded by technology which is made to fit into the common education culture. Fast growing technologies have created a huge attention on "blended learning". Author Thorne [4] stated that "Blended learning will become one the important development is 21<sup>st</sup> century". There were numerous research studies were undergone in blended learning which focusses on how to access the resources and introduce new technologies in higher learning institutions. This research has focused on blended learning experiences in higher learning institutions in global context and propose a blended learning strategies for Imam Khadhim College for Islamic Science University (IKCISU).

The main objective this research paper is to explore, critically review and compare the blended learning strategies in higher learning institutions around the globe and provide a learning strategies as part of action plan for Imam Khadhim College for Islamic Science University (IKCISU), fast growing higher education institution located in Iraq. The paper organized as follows: In section 2, research problems associated with Blended Learning are explained. In section 3, brief background study was conducted and explained the fundamentals of e-learning and blended learning concepts. Section 4 explains in detail the comparison of blended learning with traditional learning, critical review on blended learning strategies by different authors, advantages of blended learning, assessments in blended learning and challenges were highlighted. In section 5, aim of this paper was fulfilled by recommending the proposed blended learning strategies for Imam Khadhim College for Islamic Science University (IKCISU). Expected outcomes were explained in Section 6. Future of blended learning was explained as Section 7. Finally, conclusion was made in Section 8.

#### **RESEARCH PROBLEMS ON BLENDED LEARNING APPROACHES**

In today's technology world, modern learning institutions have challenges which are mainly focused on how to design, implement and deploy technology assistive learning environment, which can support and provide face to face instructions, collaborative learning groups, and for different set of locations and distance of learning. All these challenges can be taken consideration while designing the blended learning environment. In the past years, supporting educational technology such as online learning resources, portals, discussion forums and electronic based assessments are blended with face to face traditional education, which is now called as "blended learning". As per Cambridge research, education is stated as "continuous process of learning and teaching" and technology is "practical, industry oriented and more on scientific discoveries". Technology can be referred as scientific invention's such as machines and electric lights. The scope of the research lies with technology which is referred on Information Communication and Technology(ICT). Blended learning is the process of face to face to face learning and teaching activities blended or mixed with practical application of technology or online resources. Authors Ward [5] stated that blended learning is indicated as "Best of both worlds". Studies have shown that many education specialists have criticised the lack of validity which increased the attention of practitioners not on theory people. In this research, have explored the academic views and educational theories which can clearly explains the concepts of blended learning.

In past reviews, blended learning has been focused on educational and technological, in which educational focus, Bliuc[6] stated blended learning as "learning activities in combination of face to face instructions, technology based student interaction, teach interaction and accessing learning resources", in technology focus, author Alan [7] stated blended learning as using different type of internet tools which includes chats, discussion forums, selfassessment tools which can assist the traditional learning programs. Therefore, research challenges observed in blended learning is more focused on technology development and design, but not education methods. Studies on blended learning are not having much pedagogical principles, but currently there is gradual increase on the construction and focus on technology and education in balanced manner, which is termed as "education in technology".

Another challenge is on different disciplinary need to have different blended learning strategies. As per studies, technology paid more attention in education technology than professional academicians or educational theorist. Socio specialist and educationalist have not put more contribution on how technology can support in education in terms of "what" or "how".



Therefore, there was very less consideration of pedagogical skills, technologist have not meet the academic or learner's requirements. Our research paper is to investigate in detail the research gap of two constrained sections which includes ICT and non-ICT disciplines and compare the blended learning perceptions.

Authors Graham, Laurilard, Garisson [8][9] [10] stated a common thought on blended learning "it is a fundamental redesign approach for enhancing the learning and teaching based on revised current strategies". Another research challenge is on ethical considerations, which are as follows: a) Confidentiality: for instance, information collected through online and addressed by individual must be anonymous b) Flexibility: for instance, research survey conducted through online should not force the participant to take part in the survey, it should be voluntary basis's. c) Secure: data collected through online for purpose of teaching or learning must be secured [11] [12] [13]. In later section, specific challenges on implementing blended learning are explained.

## **Background Study on Blended Learning E-Learning**

The keyword "E-learning" is popular in education sector and widely accepted for all set of technology aided pedagogical approaches [14] [15] [16]. By applying computers as a communication pathway, learning instructions are provided, whereas the learning tool is the major component of e-learning systems. As a part of e-learning, blended approach have shown how the effective functions of face to face instruction and online can embedded together. For example, if an instructor wants to conduct an interactive session to the students out of class room, it can be conducted based on having rich multimedia interface and contents, learning materials can be accessed by students from anywhere and anytime with the aid of accessing the internet. For the teaching faculty, e-learning tools will be more useful for evaluating the assessments, for that faculty need to be familiar with assessment approaches along with strength and limitations, which can be combined with current assessment methodologies or tools in their content of teaching which need to be organized and efficient.

## What is Blended Learning

E-learning has evolved into combined program of multimedia rich content and it is indicated as blended learning, where it blends the face to face and online. The major strength of blended learning is evaluating the assessment immediately and provide feedbacks to students without delay. Blended learning approaches are very helpful to the teachers for delivering the lectures and assessing the student work using innovative approaches which includes rubrics etc. Assessments in blended learning plays a major role in evaluating and determining the knowledge of the students as per their discipline. Concept of blended learning is depicted in below figure 1 and figure 2.



Learning Concepts




## Figure 2 illustrates the blended learning [www.theteslaacademy.com/whatisblended/]

Blended learning illustrated in figure 1 and figure 2 are pointing towards a learning environment which are combined with various teaching styles, different delivery mode, different format of multimedia content or combinations.

The concept of blended learning is combination of face to face and online interactions. Author Graham [17] stated that "It is a mixture of class room environment, face to face and digital learning. According to Clark [18], blended learning is an instruction from class rooms with online instructions. When designing the concept of blended learning, need to consider physical space where the students can work together in common space, availability of resources, using online space (wiki, blogs), feedbacks, class attendance, grading, consultation hours. Author Singh [19], explains more on blended learning on different perspective, where there is a possibility to gain more information's and understood the concepts. Common E-learning tools which includes form Blackboard and Moodle, various Learning Management System (LMS) are available. The options provided for implementing blended learning using digital resources are as follows:

- ➢ Blogs
- Discussion Boards
- Live Question and Answer Session'
- Video Conferencing
- Mind mapping
- > Twitter
- Video capturing
- Open Education Resources

When designing the blended learning in teaching units, need to plan in advance the activities, all the components inside the activity need to be ready before student start the work and it need to fulfil the learning outcome. The activities carried out through blended learning will be more independent, so it needs to create better confidence for the students to complete the assessment tasks. Students need to be provided clear guidelines on what is the task, how it need to structured, what is the expectation and within which deadline the task need to be completed. The objective and rationale of the activity need to be defined clearly while designing the assessments through blended approach. In next section, assessment importance is explained.

Enabling Blends	The focus of enabling blend is to address the issues of accessibility and convenience. For instance, when blend provides an additional flexibility to the students or blend can attempt to support the same set of opportunities or learning experience but through different set of modality
Enhancing Blends	Blends are enhanced by allowing the introducing changes in incremental manner through pedagogy approaches, but there will not be radical change in the learning and teaching occurrence. This can occur at any side of the spectrum. For instance,

Researchers have recommended three categories of blend, which are summarized as follows in below table 1

#### **Blended Learning Categories**

	traditional learning of face to face learning, additional resources are required as part of online.
Transforming blends	Blends are transformed based on allowing a radical change through pedagogy. For instance, Learners who receives information through a model can be changed to learners who actively design a knowledge through dynamic interactions. The type of blends are enabled through technology as part on intellectual; activity.

Table 1 illustrates the summary of blended learning categories

## Assessments

In any type of e-learning tools, assessment plays an important role and act as effective tool for determining the knowledge of the students based on the enrolled subjects. Assessments are of two types: formal and informal. Under the category of formal assessment, teacher's asses the student knowledge by conducting quiz, practical exams, tutorial tasks, assignments and final examinations. The formal assessment activities will be useful for the teachers to know what they are teaching and how the learning progress is carried through assessments by assigning grades. But in-formal assessments, teacher's asses the students using a different approach like asking open ended questions during the lecture sessions, conduction class discussion etc. The informal assessments activities will be more helpful for the teachers to know more about individual students and his learning progress, and helps teachers to collect feedbacks or opinion about the teaching learning progress from the students. Therefore, assessments are very useful for assessing the students, it is embedded into blended learning by e-assessment or e-portfolio methods.

## **Blended Learning: Critical Review**

## **Revisiting Higher Education and Technology**

Today, education or technology, both plays an important role to improve the quality of life. For instance, author Hinton [20], states that higher education values provide an opportunity for improving the growth of the life for different people and culture. Moller [21] states that technology is the breakthrough for improving the life styles in today modern world. After the growth of ICT, there were heavy impact on learning and teaching environment in higher education institution, it is often considered as "catalyst" or "change". ICT had enhanced the quality of learning and teaching, while we frame a research question in this review section by framing a question of "What effective practises have been made to blend technology in higher education?", answer for this question will be blended learning, that would be our focus of research in this paper.

Enhancement or revisiting will be the improvement from one state to another satisfied state. The quality of learning and teaching will be improved based on Learning Outcomes(LO) for a specific course in a broader context under the values of higher education. University or College will be the physical space for educator, students, researchers who can work together for interaction and gain constructive knowledge. Higher education acts an important role for the contribution of community. As per researchers, in today modern education world, UNESCO plays four education roles, they are as follows: a) Learning to know b) Learning to do c) Learning to do d) Learning to be. All the four education values are general views from educators. Therefore, higher education is a process of learning and teaching for know things, performing, work in real conditions or live together, and develop self-personality which supports widely for the community.

As per reviews, there were big e-learning projects were failed due to pedagogy, culture and education learning environment. Factors such as globalization, educationalism and socio-cultural issues have become the biggest pressure for modern higher education. Turban [22] have proposed a Three Pressure Model for higher education. Figure 3 illustrates the Three Pressure Model for higher education.





### Figure 3 illustrates the Three Pressure Model for higher education.

The pressures illustrated in the figure 3 have a very effective interference role which is continuously sharpen the aim of education policies and shift on direction of education in what terms education researchers want to claim. Higher education sectors are more complicated when handling the pressures and respond to pressures, therefore there is a need to revisit the higher education roles and educational aims, therefore huge challenge for today education world is maintaining the quality of learning and teaching, when need to closely looked for a revisiting the learning and teaching objectives.

## Jones Blended Learning Approach

Researcher who have introduced blended learning concepts in University of Glamorgan suggested that blended learning will be a guideline rather than stage like model for universities adoption. Figure 4 illustrates the adoption of blended learning model proposed by Jones [23]. Author identified the power point presentation and web based learning as indication of using ICT and enhance the learning as E-enhancing. E-focus is where the discussion forums, online assessments and interactive resource sharing will be conducted. More online facilities are used in creative and extensive manner. E-intensive is one of the areas, author have highlighted in teaching and learning to be conducted in online with face to face instructions.



# Figure 4 illustrates the adoption of continuum of blended learning model proposed by Jones [23].

Jones proposed model have similarity with Garrison and Vaghuan models, where there was a rejection of dual thoughts on identifying between traditional face to face and online learning. The proposed model provides a flexibility for education analysts to identify and decide which is the better option for implementation according to the disciplines.

Additionally, there is an ability to self-evaluate and understand more choices for the implementation of this model. In this model, E-intensive approach is not suitable for all disciples, it can only be supportive for individuals who are managing their own disciplines, so there are limitations in term of unambiguous which are new to blended learning approach. Johns scale of blended learning is a very simple model, but it is more practical than other proposed learning models. Model shows the continuous progress and growth of blended learning for higher education. The scale of blended learning according to this approach will provide a direction to educators, what, how and where to embed blended learning in teaching and learning process. This model will be more supportive for individual within their disciplines rather than implementing for all programs in the higher learning institution. The review of Johns model has been compared with Allen model classification [24]. Allen [24] have classified the different level of ICT usage in education, and easy to identify the current stage based on percentage of quantity on online delivered content. Another author Cross [25] have opposed by stating percentage is not the useful way to evaluate the blended online and offline learning due to it over-simplification. John model have provided more thinking space and flexibility which is required for education. Therefore, Allen classification is not well adapted as per as John model but one limitation of john model is, it is focussing on much on technology rather pedagogy. Pedagogy approaches such as instruction based activities and social communications are not well explained in this model. Therefore, this model is not a new approach but it is an attempt to enhance the education system in professional and systematic manner.

Proportion of Content Delivered Online	Type of Course	Typical Description	<u>Jones' Continuum</u>
0%	Traditional	Course with no online technology used – content is delivered in writing orally.	Basic ICT usage
1 to 29%	Web Facilitated	Course which uses web-based technology to facilitate what is essentially a f2f course. Uses a course management system (CMS) or web pages to post the syllabus and assignments, for example.	} E-enhanced
30 to 79%	Blended / Hybrid	Course that blends online and f2f delivery. Substantial proportion of the content is delivered online, typically uses online discussions, and has some f2f meetings.	} E-focused
80+%	Online	A course where most or all of the content is delivered online. Typically have no f2f meeting.	} E-intensive

Figure 5 illustrates the Allen Blended Learning Classification compared to John Model [24]

## Garrison and Vaughan's Blended Learning Approach

Garison and Vaughan are the leading researchers in the area of blended learning, where they have well explained the concept of education process and education technology [25] [26]. Discourse and Reflection are the two key elements of educational design. Both the authors have promoted blended learning by maximizing the educational experience through a) combining online and face to face learning for improving reflection and discourse b) basically redesign and rethink the learning abilities of the students in optimised manner. Authors have developed a community inquiry framework which act as guideline for online and face to face learning and teaching instructions. Other authors have commented on garrison work by commenting that, proposed work on blended learning is promising and it considered as effective research on higher education context. In his work, he conveyed the idea of constructivism in way educational inquiry is to memorise or find out final solutions but practically to look into problems and other issues. Education process is the way for collaborative learning environment where more focus on inquiry. During this process, knowledge is refined and constructed based effective interaction and collaboration. Both the authors have argued that "Education is a "process of inquiring "who goes far from accessing on information. Inquiry is joined process and outcomes are unified, where it joins the reflection and content by motivating the student to explore and learn in collaborative manner by asking reasonable questions.



#### **Assessments in Blended Learning Model**

Assessment is part of education system to determine the knowledge of the students, it is an effective tool to evaluate student performance. Researcher Ma Xiufang [27] have proposed a model of assessment design structure based assessment policies, rules, factors, process, methodology and software's which is required for blended learning and provides the various assessment design templates to support the blended learning. Assessments in blended learning includes e-assessment, digital assessment, mobile based examinations and online based assessments. Teachers innovation and novelty in creating assessments adds the strength to the blended learning assessments

#### **Students Perception on Blended Learning**

Authors Banci [28] and his team stated that quality of education can enhanced combining two methods or strategies in an organized manner and it should be equally balanced, not creating a novel education approach by different set of education. As per the research, they have conducted a survey about blended learning to nearly 70 students, whether blended learning environment is supportive in education system or not, student achievement range and participation frequency range to the forum are measured to analyse the student's perception on blended learning. Results findings are promising in way of students have recorded more score for face to face interaction session in blended learning domain. Therefore, student perception on blended learning is more for interaction and communication on the online learning system.

#### Academic Strength and achievements in Blended Learning

Researcher Betul [29] have experimented a detailed survey on measuring the academic performance of the students who are adapted to blended learning environment. The findings shown that, learning environment is very positive on the academic achievements by the students. Web based teaching and learning in regular manner, attending in regular to online learning environment have huge improvement for beginners and advanced learners. The findings have also suggested to blend the face to face session with web based learning to achieve the effective learning environment. Researchers [30] [31][32] have viewed the blended learning as type of education model which have effective features in term of technology. Student who have experienced in blended learning and face to face traditional learning environment, result outcome shows that e-learning environment have major role in accessing resources, personal studies, extra learning, self-progressing etc., there is no major variation of scores for academic achievement for between blended learning and face to face learning strategies.

#### **Challenges in Blended Learning**

Blended learning implementation have certain challenges addressed by the researchers, it has also shows the view of isolation due to reducing the opportunities of social interaction and traditional face to face class room learning environment. Some of the challenges are highlighted below:

Students have difficulty with more advanced technology in the implementation of blended learning. For instance, students have difficulty in accessing the internet due to slower in connections which leads to difficulty in accessing the learning materials or participating in the e-discussions which creates more frustration for the students, it creates a negative reflection on the student learning.

Implementing blended learning in higher learning institution is based on time factors, whereas hard to plan and develop blended learning materials for huge number of students compared to traditional approaches. Amount of time spent is triple than traditional format.

For a Learning Management system design and development, cost is too heavy, based on budget, blended learning environment can be enhanced in higher learning institutions.

Finally, main challenge is students who are adopted to blended learning environment have unrealistic expectations. Student engaged in blended learning classes for their programs have thought of limited class means lesser time of teaching and working hours, it leads to time management and face problems on self-learning.

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## **Other Critics on Blended Learning**

There was numerous research carried out to highlight the important issues and strength of blended learning, some of the critics are as follows: Author Oliver [33], stated that blended learning compared to e-learning, term is not clear (i.e. ambiguous) and lack of clarity and it is satisfied for the education researchers to adapt to the system. Another author Driscoll [34] have mentioned that, blended learning environment varies for different people mindset, it has disciplinary limitations, mainly ICT related program and non –ICT program. Whitelock [35] have stated that theoretically blended learning is not clarified, the relationship between pedagogy and blended learning is not explained clear and it remains unclear in most of the research findings. Author Chew [34] have mentioned in detail about the growth of blended learning technology, how much it is useful and have impacts apart from educational principles. One of the main critics in his work is, blended learning environment has lack of monitoring and hard to evaluate the transformation of teaching and learning. Researchers have highlighted the lack of coaching, cost to implement, information missing, framing the type of questions in terms of where, when and how, these are the main critics addressed by the researchers in blended learning environment.

### Research Requirement and Design: Technology for Learning and Teaching

Blended learning approach is simple and excited technology in academics and research. Technology keep evolves in teaching and learning environment. The idea behind development of blended learning environment does not fit to specific technology, as per the new technologies exists in the market, blended learning are customized for teaching and learning. Many of the research focuses on technology used in blended learning and how the student and teacher's perception about the usage of technology through case studies. Researchers have classified technology as synchronous and asynchronous or formal and informal or online and offline. Based on research survey in various higher learning institutions about blended learning environment, research design settings required are summarized in the table 3:

Face to Face	Technology			
Setting				
	Synchronous	Asynchronous	Self-Asynchronous	
Lectures	Virtual Class Rooms	Discussion forum	Online resource materials	
Tutorials	Online Chat and	Portal/Announcement	Online individual	
Lab	Messaging	Turnitin	assignments	
Workshops	Videoconference	Email	Podcast/DVD	
Site Visit	Interactive White Board	Search Engine		
Consultation		News group		
Seminar		Wiki Support		
Conference		Blogs		
Examination		Online assessments		
	Virtual Learning Environment, Social Networking, Online Videos, Software Packages,			
	Simulations, Virtual Reality based learning, basic tools such as PowerPoint, Word, Excel,			
	flashcard.			

 Table 3 summarizes the blended learning technology requirements

## Proposed Model for Imam Khadhim College for Islamic Science University (IKCISU)

Imam Khadim College for Islamic Science University is located in in Baghdad and Maysan in Iraq. The university college aim is to prepare graduates to take on the task of research and teaching in preparation scientifically consistent with the teachings of Islam. College applies modern technology to the service of teaching and learning, which leads to proposed model of blended learning to maintain sustainability and create more professional graduates in study of Islam. Currently there is not much blended learning concepts implemented in the institution's Below sections propose the blended model for Islamic institution.



## Purpose of Blended Learning in IKCISU

The purpose of proposing blended learning in IKCISU is provide flexible learning mechanism and create a digital space for learners to engage in studies, motivate them and fulfil their expectations as per modern technology needs. The purpose of Blended Learning are as follows:

- Blended learning makes the student and faculty to be innovative, forward thoughts, more enterprising and create flexibility and opportunity to everybody
- Academic portfolios can be maintained and monitored for fulfilling the quality requirements, professionalism and employability.
- Overcome the barrier balance between working and studiers, it can provide more space for convenience to work and improve the personal aspects.
- > To improve the basic Islamic programs by offering flexible digital learning structure
- Helps to students who are unable to participate in higher learning program can be benefited from the IKCISU programs and refer it as study model to develop the skills
- > Helps to improve research and teaching and transfer the knowledge for outreach program in Islamic studies
- Engage with other institution which offers Islamic program and create a collaborative learning environment
- > To design and develop novel teaching and learning structure for IKCISU

### Context of Blended Learning Strategy for IKCISU

IKCISU could maintain and improve the teaching standards in way of proposing modern technology in teaching, it can also be committed to be role model for other education institution by introducing innovative teaching and learning and apply best teaching delivery methods to the students Blended learning strategy proposed for IKCISU will maintain high teaching standard based on vision and college objectives. Both the campus, when the blended strategy is introduced, need to keep the quality of delivery to the students. The context of blend need to focus on program design, pedagogy approaches, teaching principles and delivery frameworks, all of these components must be consistent and create self-learning and independent learners. Apart from that, while blended learning is implemented, need to hive more importance on staff development and training to adapt the system.

### **Proposed Blended Learning Model for IKCISU**

The proposed model of Blended Learning in IKCISU have eight set of dimensions which includes institutional oriented, pedagogy, technology, interface, evaluating, organization, facilities and resource support and ethical policies. Each dimension available in the framework has also identified with range of issues which are been identified and addressed. Each of these issues will help to organize the thought process and results in valuable learning curve or experience. Figure 6 illustrates the proposed blended learning model for IKCISU.

Pedagogy	Technology	Organization	Interface			
Imam Al-Kadhum (a) University College For Islamic Sciences Shii Wagf Office						
Imam Kadhim College for Islamic Science University						

Figure 6 illustrates the proposed blended learning model for IKCISU

#### Proposed Blended Learning Model

Pedagogy: This component is proposed to added by combing and selecting the learning information's which need to delivered in online mode or offline mode through face to face. Pedagogy need to analyse the students learning behaviour, content objective and assess the students learning outcome.



Technology: Proposed component examines he availability in continuous, accessible and user friendly of learning management system which can enable the blended learning synchronization. For this component to be added, need ICT expert or technical support for the system

Organization: The component focus on maintain the quality of teaching and planning based on quality assurance documents through lecture slides, tutorials and assessments. It also includes technical experts, infrastructure for multi delivery modes and facility improvement

Interface: This component more focus on the interface layouts which required for each features in blended learning.

Evaluate: This component will support to assess the impact of blended learning environment and determine the functionality and enhancement of learning management systems.

Resource and facility Support: This component includes online and offline resources based different interactive resources which ready to be available for the students.

Ethical: This component finds out the which are the ethical issues need to be addressed while implementing and deploying blended learning courses, for instance, no partiality, equal opportunity for learners, need to consider the culture, diversity and nationality of the students.

## **Benefits of Blended Learning for IKCISU**

Once the blended learning is proposed and deployed for IKCISU, the benefits are as highlighted below:

- Support and deliver high quality learning and teaching for learners from far distance
- Distance learning approach is supported which includes pedagogy frameworks and create competiveness in education market of Iraq
- Improve flexibility, accessibility and self-learning
- Improve the potential of integration of learning with home, entertainment, social and working
- Normal E-learning skill must for ever learner in this modern computing era, so IKCISU need to train the student to adapt the e-learning principles
- It will be innovative with advance design models and best practise for learners and teachers
- Increase in student participation
- Monitor the student assessment in regular basis and provide immediate feedbacks
- Providing big space of learning opportunity for students through broader curriculum portfolios
- Use communication medium such as video conferencing to work closely in a collaborative learning environment

## **Expected Outcomes for IKCISU**

The proposed model is implemented in IKCISU, there will be outcome of standard learning process model with a blended program for Islamic studies. The proposed model will be more on self-learning process through elearning. Below figure 7 illustrates the expected outcome of blended learning process.



illustrates the expected outcome of blended learning process.

Blended learning expected outcome based on proposed model will be:

- 1. Students will able to learn basic through online and also in face to face lecture at the college
- 2. Students can perform the assessment online and submit it in digital box
- 3. Lecturers can conduct lecture sessions and additional discussion through online environment
- 4. Lectures can be simulated by recording videos and uploaded in e-learning tools and available to students for learning
- 5. Lecturers can verify and review the assessments and grade the assessment through online.
- 6. E-learning contents which includes learning materials, unit outline, assessment, reference notes, tutorials handout, lab handout are uploaded and organized in e-learning module of the university learning management system for students to learn from anywhere and access the resource anytime.

## CONCLUSION

In this paper, blending learning approaches are reviewed in detail and proposed an effective blended learning model for IKCISU. It supports flexible, collaborative, effective and different learning experience for learners and teachers. The main attraction of blended learning lies on the technology adaption which supports learning approaches and overcomes the traditional learning system. This paper has highlighted the principles and concepts of blended learning approaches in higher learning education sectors. The paper also addresses the challenges, strength and benefits of blended learning strategies in detail. The proposed blended learning model for IKCISU is to improve the current teaching practises in the college and in future more technology measures will be taken to implement a modernized learning environment.

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# **Changing Role of Faculty Members in Technology Enhanced Learning Environments: Faculty Members 4.0**

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## ABSTRACT

The rapid and significant developments in technology are leading to different ways of doing industrial work. As a result, 'efficient' and 'smart' use of technology and Internet environments transformed business to the fourth industrial revolution introducing the term 'Industry 4.0'. In this study, in order to satisfy the needs of industry, the workforce of the future is discussed. Besides, in this global transformation, the role 'Faculty Members 4.0' of the faculty in higher education to develop themselves for using Technology Enhanced Learning (TEL) Environments is analyzed. Related research works have been gathered through a literature review; recommendations are advanced in carrying this important issue to the higher educational institutes' agenda in order for them to develop local and international strategies.

**Key words:** Faculty Members 4.0, technology enhanced learning, faculty professional development, teaching and learning, industry 4.0

## ÖZET

Teknolojideki hızlı ve önemli gelişmeler endüstriyel işlerin farklı şekilde yapılmasına yol açmaktadır. Bunun sonucunda, teknoloji ve İnternet ortamlarının 'verimli' ve 'akıllı' kullanımı iş hayatını dördüncü endüstriyel devrime dönüştürerek 'Endüstri 4.0' kavramını ortaya çıkarttı. Bu çalışmada endüstrinin gereksinimlerini karşılayacak geleceğin işgücü tartışılacaktır. Ayrıca, bu küresel dönüşüm sürecinde yüksek öğrenim kurumlarında öğretim elemanlarının Teknoloji ile Zenginleştirilmiş Öğrenme (TZÖ) Ortamlarını kullanmaları için kendilerini geliştirmeleri için 'Öğretim Elemanı 4.0' rolü irdelenecektir. Alan yazın taraması yapılarak ilgili çalışmalar derlenmiş ve bu konuyu yükseköğretim kurumlarının gündemine taşıyarak örgütsel yapıların yerel ve uluslararası stratejiler geliştirmesine ilişkin önerilerde bulunulmuştur.

Anahtar Kelimeler: Öğretim elemanı 4.0, teknoloji ile zenginleştirilmiş öğrenme, öğretim elemanı mesleki gelişimi, öğretme ve öğrenme, endüstri 4.0

## INTRODUCTION

Technological enhancements in industry facilitate access and dissemination of information, ensure efficient production which could be explained by implications of the knowledge-based economy. In knowledge-based economies, production and efficient usage of information increase the social well-being and living standards of the society (Özsağır, 2013). Today's agenda is the fourth industrial revolution, where 'effective' and 'intelligent' use of information is provided via Internet rather than sole use of information technologies for achieving identical goals. The concept of Industry 4.0 was first used in Germany to refer to the fourth industrial revolution with the term "Industrial Internet". It is an innovative change in industrial scene; where all tools and machines used in the production process interact with each other over the Internet to provide simultaneous production (Alçın, 2016).

Thus, production efficiency and reliability increase using intelligent software and systems in all stages of industrial production. Karataş (2017) also stresses that Industry 4.0 should be evaluated solely as technology usage.

The need for transformation becoming assertive in various areas such as education, health, finance, art, etc. makes Industry 4.0 expand to include wider areas beyond the industry. For this reason, 'Pedagogy 4.0', 'Teacher 4.0', 'Education 4.0' and 'Higher Education 4.0' are new terms introduced in the same context. And, researchers have begun to study how this undertaking can affect different 'life sectors' (Abdelrazeq, Janssen, Tummel, Richert & Jeschke, 2016). The task of preparing the new workforce for Industry 4.0 is a demanding issue that concerns not only the industrial organizations but also higher education institutions.

Higher education institutions should organize their academic programs, courses and its contents, focusing on the new areas of required expertise and competence for students (Gürsoy, 2016). In Turkey, facilitating these requirements in universities, there needs some institutional work be done in connection with faculty members due to their significant role in education. In this context, faculty development is essential for faculty members to follow these changes in technology, and to learn and apply innovative teaching and learning methods and environments.

In this process, the concept 'Faculty Members 4.0' can be suggested as an academic scholarship, ready for teaching and learning using technology enhanced teaching and learning environments to virtualize real industry environments. Briefly, this concept is expanded to include higher education and its stakeholders. This study addresses the changing role of the faculty members affected by global transformation due to the fourth industrial revolution, and the importance and ways of developing for this role.

## **Industry 4.0 and Workforce Competences**

Industry 4.0 brought a new perspective to not only industrial processes, but also to the expectations on the work done by workforce, and their required skills and competencies. Developments in areas such as artificial intelligence, robotics, nanotechnology, 3D printing, biotechnology, and genetics are forming a platform to support each other. Such innovations introduced by Industry 4.0 brought up some new professions where others are expected to emerge. Some possible professions to mention are; industrial data scientist, robot coordinator, IT and IoT solution architect, cloud solution expert, network development engineer, 3D printer engineer, industrial user interface designer, and wearable technology designer (Eğer, 2016). World Economic Forum (WEF, 2014) notes that some existing jobs will be endangered, some new jobs will rise, and to do other jobs there will be a need to change the required skillsets. Therefore, these rapid developments have become very important to educate the generation which will make change and adapt to changes without difficulty. This change is proportional to their adaptability, their ability to think critically, and their creative problem-solving skills (Özkök, 2005).

Turkish Industrialists and Businessmen Association - TÜSİAD (2016), mentioned in its report that Industry 4.0 will increase the manufacturing productivity and thus create more need for highly educated and qualified workforce. The importance of raising well-equipped, analytical and competent individuals is emphasized. Elci (2016) compiled the technical and social competences needed today. These include technological and disciplinary knowledge, analytical and critical thinking, ability to design and implement IT solutions, experience, ethical understanding, teamwork, collaboration, presentation and writing skills, attitude and based on human relations, being able to have both virtual and face-to-face connections. In another study Özdemir (2007) listed required skills as understanding and thinking in; broad perspective, interdisciplinary, complex, contextual, intuitive and numerical and economic issues within the framework of certain 'systems'. Being responsive from distant and independently, independent decision making, behavioral and active planning, multi-faceted perception and experience, integration and structuring, empathy building, solidarity and agreement are desirable tenets. The same study defined the student qualifications for these abilities as creativity, research and methodological, cautiousness and skepticism. Kaplanoğlu (2016) mentioned expected workforce qualities required for industry 4.0 as: lifelong learning, interdisciplinary thinking, effective problem solving, IT competency, network dependent change, process knowledge, complex business structure expertise, communication control, innovation process participation and work coordination.

Industry 4.0 workforce needs to be equipped with the formerly itemized skills, competencies and qualifications. However, there is need to consider their differences from the previous generations. Jeschke (2014) summarizes



'learning of digital natives in Society 4.0' as having new mental models (scanned reading, fast response, picture oriented), new learning styles (game-based learning, direct feedback usage), new competencies (multi-tasking, non-linear approach, tech-savvy) and new structures (networked, community oriented social life). It is necessary to prepare the workforce to adopt the necessary approaches to create a career roadmap and design future changes in industry (Töremen & Pekince, 2011). As it may be conjectured through analysis of the literature, the main and most important competence for achieving Industry 4.0 is to be able to adapt to changes as fast as possible.

#### **Transformation to Industry 4.0**

The emphasized changes are means to transition to new industry. "Fourth Industrial Revolution will create many new *cross-functional roles* for which employees will need both technical and social and analytical skills." (WEF, 2014, p. 32). A study by Schuster, Groß, Vossen, Richert and Jeschke (2016) characterizes the transformation to Industry 4.0 by mentioning that production processes are highly individualized and cross-linked, physical reality and virtual reality are more 'melted' together, international teams collaborate globally within 'immersive' virtual environments, complex virtual learning environments (VLEs) replace purely document based educational management systems, more interactive and collaborative components within higher education such as e-learning, but still not state of the art change.

Baena, Guarin, Mora, Sauza and Retat (2017) specify a transformation model: 'From manufacturing lab to learning factory'. The model stages are value creation, creation of the value chain, development of Information and Communication Technologies infrastructure for the learning factory, convergence of the real world and cyber-physical systems. They further add that "Learning Factories (LF) have shown to be effective for developing theoretical and practical knowledge in a real production environment." where consumers are included in the production process. With similar goal, Siemens has developed 'The Digital Factory' (Ersoy, 2016). Before the physical establishment of a factory all components are designed with appropriate software in the computer environment, which seems as the virtual operation of the factory and the evaluation of its results. These studies stress the need of a big change in the way of workforce teaching and learning for transition in industry. Lorenz, Rüßmann, Strack, Lueth & Bolle (2015) found that the lack of qualified personnel is one of the biggest challenges mentioned by the companies they have investigated. Another important point in professional sectors is that since the quantity needed for unskilled workforce is descending, a well-educated high-skilled workforce is an important concern.

#### The Role of Higher Education

The Council of Higher Education (YÖK), which determines the higher education strategy in Turkey, states in its 2016-2020 Strategic Plan that higher education institutions will support the transformation in the industry (YÖK, 2015). Both, Özdemir (2007) and Şahin and Alkan (2016) commented on the importance and role of higher education for disseminating quality knowledge and of qualified workforce during Industry 4.0 transformation period. This role of higher education has become a driving force in the economy where demands and expectations from higher education have gradually increased (Çetinsaya, 2014). Accordingly, 2016-2017 Higher Education Strategic Plan (YÖK, 2015) dwells on adjusting the curriculum integrity in order to prepare the quality workforce by practical training.

Studies examined the impact of Industry 4.0 in higher education; and, the importance in computer and industrial engineering education is revealed (Bayğın, Yetiş, Karaköse & Akın, 2016; Sackey, Bester & Adams, 2017). There will be an increased need of workforce with design and digital competencies who will be responsible in the diffusion of these areas. So higher education needs to concentrate more on raising the skills needed in the workforce to begin with network systems, statistical analysis and programming. At the same time, it is expected that universities need to comply with global standards by taking a more active and effective role in other areas, especially research and design (Şimşek, 2017). As a result, contribution to economic and social development is added as a third mission, besides teaching and research, to higher education (Şahin & Alkan, 2016). They add that this mission makes them a global information center where multi-disciplinary, entrepreneurship, innovation,

research and problem-solving are leading characteristics. In addition, there is a need to make boundaries between learning, research and practice 'permeable' (Jeschke, 2014).

To take a giant step for Industry 4.0, these should be considered when a new department, program opens and during course syllabi are written. They should be strengthened to embed new jobs and new work competences. When program changes are made, it should be taken into consideration that Industry 4.0 is still emerging from various systems and processes, and it should be emphasized that changes must be multifaceted and complement each other (Gürsoy, 2016). New education programs with multidisciplinary approaches that bring together electrical, electronic, mechanical engineering and computer science like mechatronics in science discipline should be created (Şimşek, 2017). To be a part of the industrial revolution and to be able to gain competitive advantage, the suitable transformation at the level of education must be organized and the workforce must be trained for such environments. These changes in the higher education should empower involvement of the locomotive of teaching and learning, namely, the faculty members.

### The Role of Faculty Members

Faculty members will have the role of developing the new workforce in the industrial transformation. The rapid change of information will foster the importance of 'continuous learning'. Bozkurt (2016) claims that the seventy more years of traditional human resources management contemplation will change and emphasizes to invest on 'sustainable knowledge' and 'continuous learning'. Faculty member's aim should be not only to provide information to the students but also to teach them how to access and use the information when needed. Since, in the past more narrow and profound knowledge was concerned as higher expertise, now there is a need to know and understand the whole process (Kaplanoğlu, 2016). The faculty members need to support students' creative, innovative and entrepreneurship capabilities. Balay (2004) makes an important point by saying that "In the Information Society, it has become important for the teachers to take action towards the possible consequences of the change process in the globalizing information society, and to prepare the man and society for the future in such a way that they can cope with change".

Bayğın et.al. (2015) suggest three teaching and learning steps for engineering students: conveying Industry 4.0 design principles theoretically, then lab practices and finally real workplace projects. Jeschke (2014) details 'the new way' of higher education for lab practices as using virtual labs as simulation environments, remote access to real experiments and augmented realities by 3D simulators. Many research supports that younger students think and learn in a unique way, although using Personal Learning Environments (PLEs), informal and formal teaching integrated with tools and technologies, can be difficult to implement since there are significant concerns about the readiness of faculty (Davidson, 2017). He suggests a solution merging newer digital technologies with traditional teaching methods. For learning augmented realities and virtual worlds, Jeschke (2014) suggests the needs of having new teaching and learning models and scenarios, new approaches to IT infrastructures in higher education, close the experience gap between faculty members and students. Collis (1999) mentions the benefits of classroom in cyber-space and Davidson (2017) is concerned about higher education institutions modifying their online learning system infrastructure.

We would like to call the academic authority which is ready to teach in Technology Enhanced Learning (TEL) Environments as 'Faculty Members 4.0'. They need to develop themselves in teaching and learning for Industry 4.0. The use of these environments shows that learning can increase satisfaction from the point of view of both the lecturer and the student besides the student can be more active, participative, committed and motivated (Elçi, Abubakar, Özgül, Vural &Akdeniz, 2016). Thus, only using technology will not be an objective; high technology production process such as technology for intelligent systems, robots, unmanned factory will be taught and practiced. In this case, it is the responsibility of the faculty members to design, develop and use these TEL environments in the process of teaching and learning. It will be useful for the instructors to follow the innovations in TEL and apply them in practice for the effective use of this environment.

## CONCLUSION

It is inevitable that moving to Industry 4.0 will require big investment, radical changes and technological development. Since the possibilities offered by Industry 4.0 will benefit the nation, it is necessary to develop the



required workforce while preparing the infrastructure. In that connection, this study discussed the changing role of faculty members, referred as 'Faculty Members 4.0', and the importance of development in the Technology Enriched Learning environments.

Turkey can take an active role in this transformation process by first determining the required workforce skills and competencies. The main identified competencies are creative, analytical, critical, interdisciplinary, systematic, contextual thinking, innovation, entrepreneurship, problem solving, multi-faceted perception and experience, integration and configuration. In particular, the provision of appropriate infrastructure and training is emerging as the main factors that will enable transformation.

Faculty member's multifaceted development for Industry 4.0 may first start with learning and eventually mastering the technology Industry 4.0 uses. In that connection, learning is preferred to be on-site learning merging theory and practice.

Secondly, capturing suitable innovative teaching and learning methods faculty members are to share this knowledge with their students. Finally, they can design and develop courses that allow their students' learning in digital environments. This is expected to include simulations and immersive virtual learning environments.

Faculty members might not affect mentioned development on their own. Higher education institutions need first to upgrade their technological infrastructure including e-learning, at the same time revamping organizational structure including enhancing faculty development centers. This center should design and develop programs for supporting faculty members.

Higher Education has an important task to develop faculty members for the situations likely entailed by Faculty Member 4.0. For this purpose, the teaching academics must develop themselves in parallel to industrial workforce; so that, they can equip their students by practicing using TEL environments.

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